



ROCK PRODUCTS



JULY, 1948

THE INDUSTRY'S RECOGNIZED AUTHORITY

VOL. 51, No. 7

Ralph S. Torgerson
Managing Editor

Bror Nordberg
EDITOR

Nathan C. Rockwood
Editorial Consultant

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"WE HEAR..."

July, 1948

Dust around high tension power lines can be a direct hazard to operations as a sufficient concentration of dust can carry an arc. Recently sandstone dust acted as a conductor which grounded a 220,000-volt transmission line during drilling and blasting operations on a highway project in Southern California, killing one workman. He had fired a light springing charge in a vertical hole which at the surface was 50-ft. below the power line. The resulting column of dust rose, contacted the line and carried a flash arc to the ground near the workman.

* * * * *

Military and naval projects totaling \$434,735,000 are authorized by two bills approved by the Committee on Armed Services of the House of Representatives. Housing, test stations, hospital facilities, and air bases will be included in construction activity here and abroad.

* * * * *

The third temporary railroad freight rate increase, an estimated 3.6 per cent over the second authorized on October 6, 1948, differs from previous increases in that it does not apply as uniformly to all territories or commodities as the previous increases. Rates are higher in the Eastern and Southern territories by 30 and 25 per cent. Percentage increases exempt certain heavy low-value industrial commodities usually shipped in bulk including cement, sand and gravel, bricks and building materials. On most such commodities, increases have been granted on a flat, cents-per-unit-of-weight-basis.

* * * * *

The Civil Aeronautics Administration has asked Congress to approve a \$52,-576,455 national airport construction program, containing 200 new airport projects and 106 previously recommended but not yet undertaken in the current fiscal year.

* * * * *

Rationing of gasoline and fuel oil is being urged in Congress, but the outlook is for no action now, at least not before next year.

* * * * *

Highway programs of the 48 state highway departments and the District of Columbia call for the building of 46,821 miles of state and federal highways during 1948 at an estimated cost of \$1,072,283,810, a recent survey by the American Road Builders' Association shows. The roads to be built include 3414 miles of concrete roads, and 25,631 miles of bituminous mixes and treated types.

* * * * *

Builders and tool and heavy-equipment producers have the job of installing \$18,700,000,000 worth of new plant and equipment in 1948, according to an official study of industry's plans for the year. The 1947 total was \$16,200,000,000.

* * * * *

Hydrated lime has found a new use as an aid in keeping litter in a desirable dry condition for brooding chicks. The Ohio experiment station states that the lime can be used with any of the common litter materials, such as straw, ground corn cobs, wood shavings, peat moss, or cane litter. The principal requirement is that the litter be stirred at frequent intervals and additions of hydrated lime and fresh litter be made as indicated by the condition of the litter.

WE HEAR

Nearly 10,000 apprentices joined the ranks of trainees in the building trades during March, the Labor Department's Bureau of Apprenticeship announced, marking the largest increase ever recorded, swelling the total on April 1 to 124,294 apprentices employed in the building crafts.

* * * * *

The prefabricated housing industry has been denied any increase in steel supply.

* * * * *

Employers can sometimes set up an employes' profit-sharing plan that allocates bonus payments both to straight-time and to overtime hours so as to satisfy overtime-pay requirements of the Fair Labor Standards Act. A circuit court of appeals approved a wage pact that calls for a fixed hourly rate for the first 40 hours plus time-and-a-half rate for overtime and for payment of profit-sharing bonuses in proportion to employes' monthly straight-time and overtime pay.

* * * * *

New houses and apartments started in 1948 will include about 950,000 dwelling units, by official estimate. About 835,000 units were completed in 1947.

* * * * *

Wages for the average hourly rated factory worker have been boosted 84 per cent since January, 1941, according to U. S. News. Weekly earnings are up 91.3 per cent, while living costs since January, 1941, increased only 62.5 per cent. On the other hand, raw material prices have advanced an average of 134.6 per cent at wholesale since January, 1941. Wage costs for the manufacturer are up 84 per cent. Together, wages and raw material costs account for about 3/4 of the total price of finished goods. Finished goods prices, however, are only 81 per cent above January, 1941.

* * * * *

Production of fertilizer this year may exceed 16,000,000 tons, in comparison with pre-war commercial sales which averaged about 7,000,000 tons per year. Some experts estimate that production might even hit the 20,000,000 ton mark within a few years, with the demand being nation-wide. Illinois for example used 39,000 tons yearly in 1935-39, but took 361,000 tons last year. Indiana farmers, who used 245,000 pre-war, spread 800,000 tons last year.

* * * * *

The House recently passed the Federal-aid highway bill providing for a 3-year program of \$500,000,000 annually for the fiscal years 1950, 1951 and 1952.

* * * * *

A bill authorizing expenditure of \$200,000 for a federal survey of the proposed Missouri River Scenic Parkway passed the House of Representatives recently and has been sent to the Senate. Ten states stand to benefit from a national parkway along the Mississippi, representatives said, stating the parkway is a much needed north and south travelway and a worthy long range program for public work employment.

* * * * *

Violation of state load restrictions resulted in more than 500 arrests within a month in Minnesota, according to the State Department of Highways. Most of the arrests were the result of weighing axle loads on the spot by portable loadometers.

* * * * *

A new first-quarter high mark in dollar volume of construction contracts has been set in the 37 states east of the Rocky Mountains with a total of \$1,986,936,000. This volume surpasses by 23 per cent the previous first-quarter record established last year, F. W. Dodge Corp. reports. While the dollar volume of residential contracts was maintained at a level equal to the first quarter of last year, non-residential contracts were up 42 per cent and heavy engineering awards increased 46 per cent.

THE EDITORS

Editor's Page

Monopoly May Follow Changing Pricing Methods for Cement

THE U. S. SUPREME COURT DECISION of April 26, 1948, upholding the Federal Trade Commission, has outlawed the multiple basing point delivered price system long in use by the portland cement industry, but anything else that has been accomplished thus far by the ruling represents confusion plus.

No one seems able or willing to interpret for the industry on what basis prices should be established, in order that cement manufacturers can comply in good faith. Apparently, whether or not freight absorption by individual mills in order to meet competition, constitutes violation of anti-trust laws will be decided case by case as occasion will demand interpretation.

F.T.C. has ruled substantially that the industry cannot use any pricing system resulting in uniform prices within any locality, and that prices cannot be on a delivered basis unless the price at point of delivery reflects the cost of shipping. It seems that non-regular freight absorption to meet competition may not in itself constitute violation or that an f.o.b. plant price isn't mandatory, but the decision of the court casts some doubt as to the right of a company to absorb freight as a means to avoid monopoly that might otherwise be vested in another mill. There appears to be some question as to how often a manufacturer can absorb freight before the practice might be declared a pricing "system" and one which is discriminatory to other customers; enough so that some manufacturers consider the only safe bet to be establishment of a mill price to which shipping costs would be added and the customer pay the freight.

Creating Monopolies

Should that practice have to be followed, and that apparently is the only absolutely definite assurance of compliance in the opinion of some who have analyzed the decision, the consumer of cement will very soon find out that the old system of pricing wasn't so bad. There will have been set up some iron-bound monopolies in areas where single mills operate, that will be protected, in fact, by law.

With cement manufacturers able to sell every barrel they can produce, which they are doing today, an f.o.b. mill pricing method will have little effect on their businesses but the picture obviously will change when supply substantially exceeds demand. Then single mills in lucrative consuming centers could easily capture all of the business by simply underpricing more distant competitors. The more efficient such a mill be, the more it might increase its prices under those conditions and yet

just fall short of that which must be quoted by the closest of more distant mills, and thereby reap exorbitant profits out of consumers who still are buying from the most economical source available. Yes, there would be shrinking marketing areas for each mill over the country.

Proponents of the f.o.b. mill price method, individuals outside the cement industry, argue that mills desiring to reach certain markets should make their mills more efficient or establish plants in those centers; otherwise forego the business. That reasoning doesn't hold water in our book. Cement plants must be located at sources of suitable raw materials and more often than not, hundreds of miles are involved and therefore freight rate differentials far in excess of any savings that could possibly be made through more efficient plant operation. Decentralization, which evidently is a goal of the F.T.C. for all industry, might gain momentum in the cement industry but the cement industry isn't a penny-ante business. It takes money to build plants, it takes assured volume of business to keep them profitable and it takes large scale production for low unit cost.

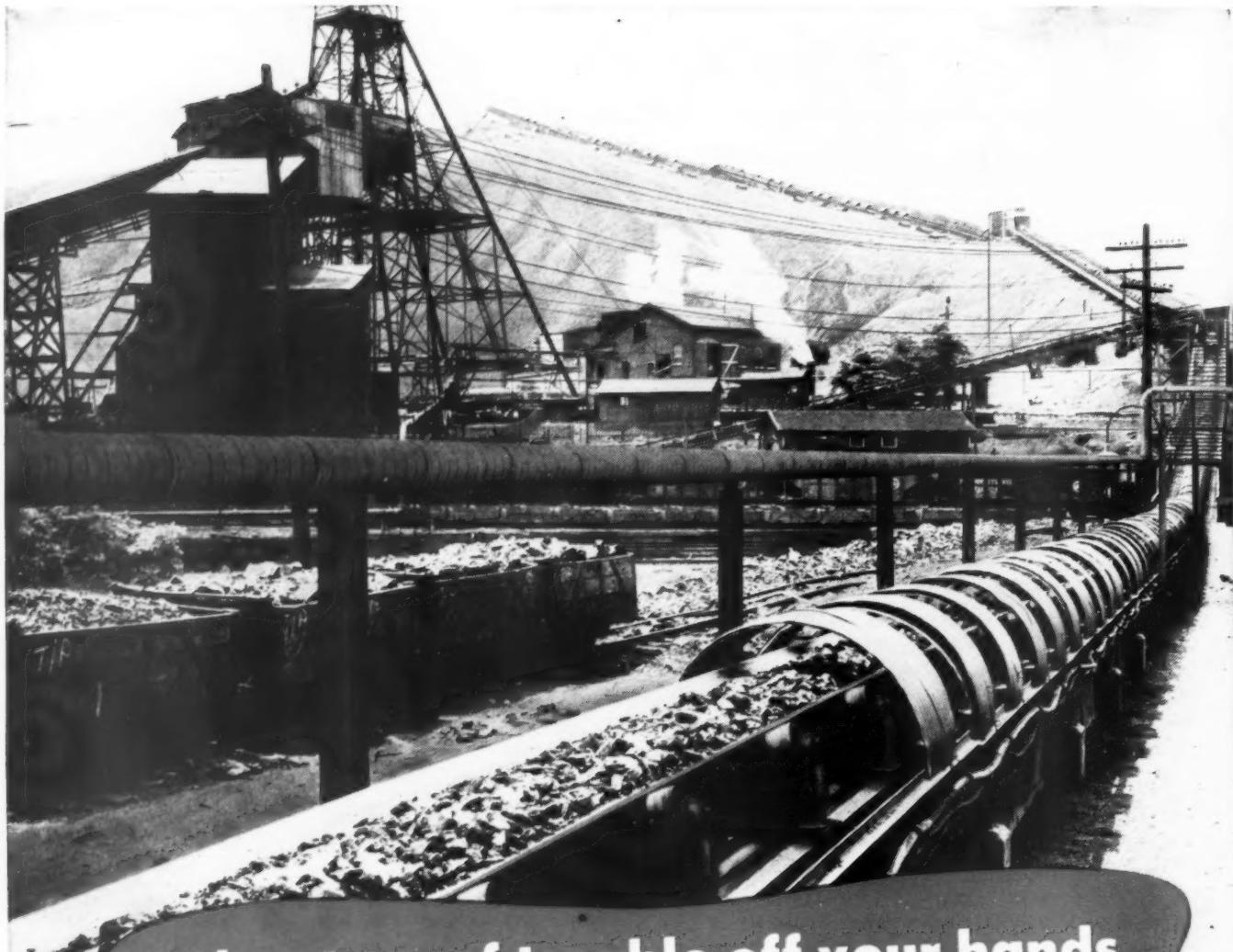
Disadvantages to Consumers

The consumer—the ready-mixed concrete producer, concrete products manufacturer and contractor—may have to assume a lot of troubles that the traffic departments of cement plants customarily had handled for him. There would be the calculation of freight rates, shopping for supplies of cement, mill prices to consider and uncertainties in bid prices. As a concrete construction project progresses more distant from a cement mill, prices must advance progressively. And, if he isn't able to get cement from the now over-taxed local mill, his costs must increase significantly or he might even have to move closer to another source.

Furthermore, users and manufacturers know that there is a vast difference in the qualities of so-called "standard" cements. Hitherto a user has had a choice and could select a brand that his experience had proved serves his purpose best. Under this court ruling, if it stands, he must accept the brand of cement which has a monopoly in his locality and adapt his practice to it.

The ruling is thus *removing competition in quality* which has been a large factor in improving American portland cements.





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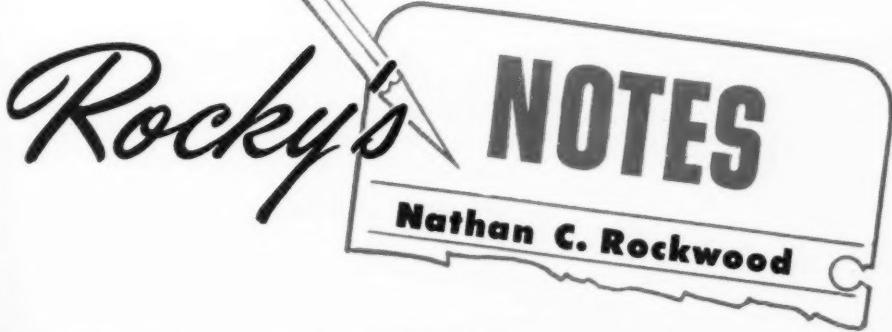
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Those German Autobahnen (Automobile Highways)

SOME of us remember the post-war years of World War I. Our industries were sitting on top of the world—our success in arming our allies and finishing that war brought the envious admiration and respect of former allies and foes alike. A result was many visitors from abroad to see with their own eyes how we did things. The German delegations included portland cement manufacturers and concrete engineers and experts.

Later, when Hitler was bidding for supreme power in Germany, one of his promises was to supply a cheap "every man's" automobile. For using them, he planned several thousand miles of super-highways. We know now that they were designed for a network of military highways, but doubtless his promises of a motor car for every German were as sincere as some promises made by candidates for political office in the U.S.A. about the same time.

No High Opinion of American Practice

American engineers and concrete experts were proud of their achievements in the early 1930's. They had paved hundreds of thousands of miles of highway with concrete, had developed designs, techniques, machinery, etc., which they believed were the last word in highway engineering. However, our German visitors were not much impressed: in fact, they let it be known that they found little if anything to add to their own knowledge of highway construction. Their American hosts were inclined to think them snooty and ungrateful.

Those German engineers who survived World War II must take a certain professional pride and satisfaction in the return visit of American engineers and concrete experts in the last year or two. For these visiting Americans may learn something helpful, albeit somewhat grudgingly. Two of the most recent American visitors to Germany on this mission were F. H. Jackson and Harold Allen of our national Public Roads Administration. Mr. Jackson made a very brief report of his findings at the annual convention of the American Concrete Institute in February. His complete report is now published in

the June issue of *Public Roads*, official journal of the Public Roads Administration.

Cautious Praise for German Practice

Although Mr. Jackson, a critic of American concrete pavements built during the same decade as the German ones, is cautious about praising German practices and accomplishments, he does suggest as a result of his observations that our American practices (and construction materials, including portland cement) may possibly be improved. His favorable opinions of the German concrete pavements are carefully qualified by statements that at least most of these have not been subjected to the severe climatic conditions or to the heavy truck traffic of similar pavements in our own country. This is probably so, yet war traffic in Germany could not have been very much easier on its pavements than was war traffic in our country.

Apparently, German engineers did nothing more than apply elementary principles of highway construction, known to all engineers the world over since highway building became an engineering science. For reasons that we have never been able to fathom, those elementary principles were being largely neglected by American highway engineers at the time these German visitors were studying their techniques and practices. Consequently, we can understand why the German roadbuilders were (privately probably) disgusted and distainful as a result of their American observations.

The prime detail the German engineers have observed is adequate preparation of subgrades. Wherever the subsoil was not sandy or granular, they always laid a mat or cushion of granular materials, varying in depth with the requirements. Whenever possible, really bad subsoils were bypassed in the location surveys. Damage by frost from undrained subgrades was prevented, according to Jackson and Allen, as follows:

"1. Placing the concrete slab a sufficient height above ground water to avoid saturation by capillarity, or lowering the ground-water table by drainage.

"2. Replacement of soils susceptible to frost damage with soils not susceptible to such damage.

"3. Use of layers of coarse granular material or of impervious strata such as bituminous concrete slabs, to prevent capillary rise of ground water."

Moreover, "In a great majority of the mileage, the concrete slab was placed on embankment. In flat terrain the grade line was raised 3 ft. or more above the natural ground level, and in cuts the roadway was excavated below grade and backfilled with selected material. This procedure provided good drainage and in the open plains simplified snow removal."

Inferior Cement (and Concrete)?

M. A. Swayze, an American cement and concrete expert, studying the German portland cement industry as an official U. S. Government observer, in 1945, reported: "The great majority of the plants visited were making a product which was inferior in practically every way to the cements manufactured in the United States or in Great Britain."

This observation, of course, refers to the post-war cement-plant operations. However, with Hitler preparing for war and with the needs of war industries for fuel and power all important it is doubtful if the cement used in the construction of these highways was any better.

The concrete was made with 1.35 to 1.57 bbls. of cement per cu. yd., of a variety of coarse aggregates, having a maximum size of about 1 in., but of good quality—hard rocks such as granite, basalt and quartzite being preferred. Fine aggregate—sand in most cases—was furnished in two or more sizes. Evidently there was close control of both fine and coarse aggregate grading. There was no fixed water-cement ratio. It was made to fit the particular materials. The mixtures were dryer than American practice and the concrete was compacted into place and cured under a tent.

The pavements examined by Jackson and Allen were found to be practically free from scaling and to have far fewer cracks or other indications of failure than similar pavements in the United States. They say "the concrete is good and from this fact we can conclude at least that it is possible to make good concrete with German [inferior] cements provided other conditions are right."

Maybe it took acute fuel and power shortages to prove to German cement manufacturers that "high grade" cements are not necessarily required for good concrete; maybe they had already learned that relatively coarse cement with good particle size gradation was better than an extremely fine-ground product. Anyhow, Jackson and Allen do not emphasize what seems to us the prime lesson to be learned from the German autobahn: that no pavement concrete can be good for long if the fundamental principles of subgrade preparation are neglected.

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LABOR RELATIONS TRENDS

A "Legal" Profits-Sharing Plan

By NATHAN C. ROCKWOOD

MANY EMPLOYERS, particularly those in relatively small industrial establishments, believe the ultimate solution of labor-management harmony lies in profits sharing, or some other kind of incentive bonus over and above "regular pay." Much progress was being made in this direction until the courts began to rule that such "bonuses" must be included in establishing "regular rates" of pay for the purpose of computing the one and one-half overtime rates, required by the Fair Labor Standards Act. That made rates more than employers had bargained for (literally, too, in many cases). Because of the utter disregard exhibited by some of their employes of this attempt to be fair and generous, through the filing of suits for enormous amounts of back pay, many employers have dropped profit sharing, and many others have dropped plans to begin profit sharing.

This matter of computing overtime pay is one of several glaring weaknesses of the F.L.S.A., brought out in hearings before committees of Congress, which presumably will lead to revision of the Act. The issue of defining what is the "regular rate" has highlighted many controversies over the meaning of hourly wage stipulations in union labor contracts, and in nearly every instance has been decided favorably to the most outrageous contentions of labor attorneys.

Appeals Court Decision

A recent decision by the U. S. Circuit Court of Appeals, Sixth Circuit (Cincinnati, Ohio), which incidentally has made other common sense decisions in labor cases, is especially interesting for at least two reasons. It concerns a relatively small corporation, employing about 400, which would fit the great majority of American business enterprises, and it cleared the employer of wage liabilities of about \$1,500,000, had the courts decided otherwise. Since this, like many such enterprises, is a single commodity manufacturer, with no great amount of assets, an adverse decision could very well have put it into bankruptcy and deprived the employes and the community of a means of existence.

The case was tried originally in a U. S. District Court in Michigan and decided against the employee's contention for inclusion of all the profit-sharing bonus in computing "regular rate" so as to result in excessive overtime pay. The employee appealed to the Circuit Court of Appeals, which affirmed the lower court's decision. It seems doubtful under the circumstances if anything would be gained by union labor through carrying the case to the U. S. Supreme Court, but

that remains to be seen. In any event those hardy employers who wish to continue or to start profit sharing in spite of technical obstacles will be interested in the details of this plan, which has passed the tests of the lower courts.

Details of Profit-Sharing Plan

The company makes abrasive products (grinding wheels chiefly) selling most of its output on specific orders—a highly competitive and not a particularly stable kind of industry. Realizing the relatively unstable character of the business, the company started a number of years ago to provide incentives and attractions for its employes, which included a hospitalization plan, an annuity plan, group life insurance, and the profit-sharing benefit fund that is the core of this controversy. The fixed hourly wages were increased voluntarily from year to year, and everything seemed to make for one happy family until 1945, when this family was discovered and organized by a labor union. At that time the base rate was 90¢ per hour and had been at that figure since 1942. After the passage of the F.L.S.A., the company complied conscientiously with the 40-hour week and overtime provisions.

In order to meet the fluctuations in the business over a period of years, the company management devised a "Production Savings Plan," which was also designed to increase the production efficiency and make the employer better able to meet competition. The district court judge was satisfied that the purpose was not to circumvent the law, as the employee charged, but was a realistic and workable arrangement, of which the F.L.S.A. administrator was fully advised.

In the language of the court the plan was described as follows: (1) A production value was given each item produced that entered the inspection department, which value was the list price less the trade discount. The total production value was calculated monthly with adjustments for partly manufactured products. (2) A certain percentage of this total monthly production value was then computed. This percentage bore close resemblance to the direct labor costs of production in preceding years. At the inception of the plan it was 19 per cent, but from time to time increased until it was 24 per cent in 1943, where it remained up to the time of this suit. (3) The total hourly wages in straight time and in overtime for those eligible under the plan was then computed for that month. (4) If the total of the hourly wages for the month exceeded the percentage of the production value for the month, the employees received

no additional compensation; but if the total of the hourly wages paid was less than the percentage of the total production value, the difference was distributed to the employees as additional compensation.

The other steps were: (5) This additional compensation was distributed as follows: The amount to be distributed was divided by the total actual labor costs, including both straight time and overtime (less the hourly wages paid to ineligible employees), which resulted in a percentage figure. This figure became the bonus rate for that month. Each employee's total monthly straight time pay and overtime pay was increased by this percentage. Since the plan had been in operation (1938) there had been only two months when no fund was available for such distribution.

There was no provision in the plan for recovery from employees of any portion of the funds so distributed in the event the amount allocable in any month was less than the amount already paid to them at the fixed hourly rates. [That was just the employer's hard luck!] There was no way to determine what part, if any, of the funds available for distribution was due to the increased efficiency of the production employes, since it represented the combined result of numerous factors, including installation of new and improved machinery, improvement in engineering services, operation of the plant to more nearly its capacity, the efficiency of the sales department and of the management.

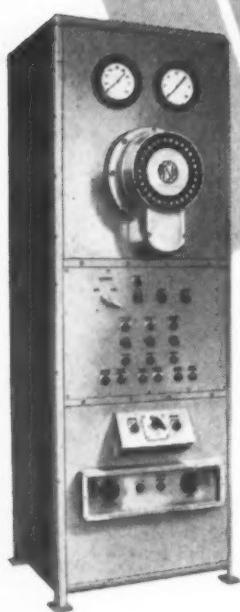
All this the trial judge found to be a sincere effort on the part of the employer "to share with its production employes not only any increased income resulting from increased efficiency of these production employes, but also a substantial part of the increased income resulting from its investment in improved machinery and from improvement in its engineering and management; and that the employment contract divides the incentive wages into regular and overtime segments in a realistic and mathematically workable manner." The appellant (employee) contended that the workers were actually paid on a piece-work basis, and relied on numerous court decisions (including the U. S. Supreme Court) as proof.

Crux of the Issue

The Circuit Court of Appeals said: "This case is governed by determining the 'regular rate' at which the appellant was employed according to the Supreme Court's general definition thereof, instead of applying the rulings applicable to piece-work employment. * * * It becomes merely a matter of mathematical computation. After first ascertaining the total compensation (which includes both the regular wages at the contract hourly rate and any bonus or profit sharing) actually paid during the normal non-overtime work week, such total com-

(Continued on page 103)

Lettin' the Cat outta the Bag!



Left—A-S-H Automatic Sequence Head of the Automatic Sequence Hydrovac. Note that the initials of both are the initials of our company's name, A-S-H, Allen-Sherman-Hoff. This equipment "practically thinks for itself," and while its initial cost is higher than manually operated systems, it is actually more economical in the long run, because of what it saves in time and maintenance. Often it pays for itself in about a year.

It took five long years of designing, experimenting and building to perfect the new Automatic Sequence Remote Control Hydrovac System for handling anything from the finest dust up to loose, bulk granular materials of various sizes. To the men and companies contributing to this development, quite aptly referred to as the "Pneumatic Materials Handling System of Tomorrow," we express our heartfelt thanks. . . . We are "Lettin' the Cat Outta the Bag" with the publishing of a new catalog, covering manual and automatic systems for handling material in metal and non-metallic mines, coal burning generating and heating plants, process industries, etc. . . . A letter from you will bring one of the catalogs very promptly. If your problem is urgent, tell us in the letter that you want an engineer to bring the catalog and discuss your particular job with you.

ALLEN-SHERMAN-HOFF CO., 1435 LOCUST ST., PHILADELPHIA 2, PA. Offices & Representatives in Principal Cities

the Personal Side of the news

Reelected President

R. G. L. HARSTONE has been re-elected president of the Queenston Quarries, Ltd., and National Cut Stone, Ltd., also vice-president and



R. G. L. Harstone

managing director of Canada Crushed Stone, Ltd., all of Hamilton, Ontario, Canada. ALAN V. YOUNG has been named president of Canada Crushed Stone. ARTHUR MICHIE is vice-president and general manager of the Queenston company, and R. K. CUNNINGHAM, vice-president and general manager of National Cut Stone, with D. H. Henderson, chairman of the board. D. E. STEELE is secretary-treasurer of the three companies.

Safety Chief

JOHN J. FORBES has been appointed chief of the Health and Safety Division of the Bureau of Mines, Washington, D. C., succeeding Daniel Harrington, who has retired. Mr. Forbes has been assistant chief since July, 1945. He joined the Bureau of Mines as a first aid miner in 1915 and was appointed supervising engineer of the Safety Division in 1927. He continued in this capacity until 1941 when he was appointed chief mine inspector to supervise activities under the Federal Coal Mine Inspection and Investigation Act. Mr. Forbes is the author or co-author of many of the Bureau's publications on mine health and safety.

Candidate for U. S. Senator

TERRY CARPENTER, operator of one of the largest and most modern concrete products plants in Nebraska, also a sand and gravel business and other enterprises in and near Scottsbluff, Nebr., has filed as a candidate

for United States senator from Nebraska. Mr. Carpenter received the endorsement of the Nebraska Democratic pre-primary convention at Omaha recently.

Rotary Club President

OTIS H. WALKER, owner of the Concrete Products Co., Junction City, Kans., which he established two years ago, has been elected president of the Rotary Club of Junction City, succeeding Harry B. Russell. Mr. Walker was associated with the Missouri Portland Cement Co., St. Louis, Mo., as special representative back in July of 1936. Later he was made assistant to the vice-president in charge of sales. He left there to become material engineer with the C. H. Atkinson Paving Co., Chillicothe, Mo. Soon after, he joined Commonwealth Aircraft, Inc., Kansas City, as plant layout engineer, and in February, 1944, was made assistant plant engineer, six months later becoming plant engineer in complete charge of all building construction and maintenance. Just previous to building his own concrete products plant, Mr. Walker was office engineer for Wm. S. Rawlins & Co., Kansas City, Mo.

Towboat Christened

W. A. WECKER, president of Marquette Cement Manufacturing Co., Chicago, Ill., together with V. A. Kogge, transportation manager, were among those present at the christening of the new towboat MV JOHN LUCHOW, named for Capt. John Luchow, marine superintendent. Mrs. Luchow sponsored the boat.



Present at christening of towboat MV JOHN LUCHOW were, left to right immediate foreground, V. A. Kogge, transportation manager, Capt. John Luchow, marine superintendent, Mrs. John Luchow, sponsor, and W. A. Wecker, president

Elected Mayor of Azusa

HARRY JUMPER, chief engineer of Consolidated Rock Products Co., Los Angeles, Calif., has been elected Mayor of Azusa. He has also been elected



Harry Jumper

to a two-year term on the City Council. Mr. Jumper was a councilman from October, 1938, to December, 1942. He served as mayor from April, 1942, until December of that year, when he went into military service. In April, 1944, Mr. Jumper was again elected to the council for a four-year term.

Celotex Appointments

LEONARD A. HERMAN has been appointed general auditor of The Celotex Corp., Chicago, Ill., succeeding William D. Becker who has been elected controller of the corporation.

NEWS

Research Engineers

EDWIN A. MYERS, an engineer in the Cellulose division of The Dow Chemical Co., Midland, Mich., has been appointed research and development engineer in the mechanical development and engineering department. He has been with the company since 1936 and received his training in mechanical engineering from the University of Michigan. EMMIT W. ARCHER, formerly with the Udylite Corp. in Detroit, has been named research and development engineer in the magnesium laboratory. Mr. Archer received his B.S. degree in chemistry from the University of Indiana in 1943.

Entertains Dealers

R. V. D. BOOTH, president of Union Sand and Supply Corp., Painesville, Ohio, recently entertained the company's dealers from northeastern Ohio and Pennsylvania with a dinner party. Seventy guests were present, including William Wood, general manager of the Cleveland Slag Co., Youngstown, Ohio; E. J. Fox, sales manager, Standard Portland Cement Co., Painesville, Ohio; Glenn Dumond, general superintendent, and F. K. Gregory, also of Standard Portland Cement Co. Mr. Booth's talk concerned the type of advertising used by the company, and Al Marty, sales manager, spoke on the introduction of the two new core concrete block.

Manager of Sales

JAMES J. RYAN, formerly manager of metal lath sales, National Gypsum Co., Buffalo, N. Y., has been appointed to the newly created position of manager of gypsum, lime and steel products sales. Mr. Ryan has been with the company since 1934 and has been associated with the building material business since 1927, being particularly active in the promotion of metal lath. During the war, he served as a representative of the industry on the War Production Board and later with the Office of Price Control. At the present time, Mr. Ryan is chairman of the Metal Lath Association.

Manages Concrete Plant

WILLIAM H. ROHWEDER has been named manager of the Worthington Redi-Mix Co., Worthington, Minn. This concern, formerly known as the Concrete Aggregates Co., is owned by the Graves Brothers Construction Co., Melvin, Iowa.

Association President

JOSEPH REICHGUT, secretary-treasurer of the Maloney Concrete Co., Washington, D. C., has been elected president of the Washington Association of Credit Men, Inc. This association, comprising most of the leading wholesalers, jobbers, distributors, and financial institutions in the metropolitan area of Washington, D. C.,

is affiliated with the National Association of Credit Men. Mr. Reichgut served as a member of the board of directors for many years.

Elected President

ROSCOE R. BUSH, purchasing agent of Pacific Coast Aggregates, Inc., San Francisco, Calif., has been elected president of the Purchasing Agents Association of Northern California, Inc.

Assists Director

JULIAN W. FEISS, editor of *The American Mining Congress Journal*, has been appointed mineral consultant and assistant to James Boyd, director of the U. S. Bureau of Mines, Washington, D. C.

Appointed Co-Chairman

EDWARD J. NUNAN, sales engineer for the Buffalo Slag Co., Inc., Buffalo, N. Y., has been appointed co-chairman of the Industrial Division of the Canisius College Building Fund in Buffalo.

Joins Pipe Concern

WILLIAM MOONEY, II, formerly associated with the Raymond Concrete Pile Co., New York, N. Y., has been appointed sales representative for the southeastern area of the Universal Concrete Pipe Co., Atlanta, Ga.

OBITUARIES

EDWARD LOUIS BUSHMAN, founder and retired president of the Modern Valve-Bag Co., which was sold in 1941 to the St. Regis Paper Co., New York, N. Y., passed away on May 24 in East Orange, N. J. He was 91 years of age.

LEONARD W. MACATEE, president of W. L. Macatee & Sons, Inc., Houston, Texas, died recently at the age of 78. Mr. Macatee joined his father's building materials firm in 1900 and became president in 1918. He and Mrs. Macatee celebrated their golden wedding anniversary last November.

WILLIAM L. ROSCOE, superintendent of the Howes Cave plant of the North American Cement Corp., New York, N. Y., was killed in an accident, we have just learned, on May 15, 1947, in the town of Cobleskill, Schoharie County, N. Y. He was 50 years of age and had been connected with the company since 1918, first as general mill foreman and then assistant superintendent of the Catskill plant. Two years ago he was transferred to Howes Cave as superintendent. Mr. Roscoe is author of the series of articles on accident prevention appearing in the May and June, 1948, issues of *ROCK PRODUCTS*. He has always been interested in safety work and at one time was chairman of the safety committee.

MRS. EMALEA PUSEY WARNER, wife of the late Alfred D. Warner, president of the old Charles Warner Co. until 1915, and mother of Charles, Alfred D., Jr., and Irving Warner, and grandmother of Charles, Jr., Fred, Irving, Jr., and Lea, Jr., Warner, died at her home in Wilmington, Del., on April 13. She was 94 years of age. Mrs. Warner has been called one of Delaware's great leaders. Largely through her efforts the legislature of Delaware established the Women's College in 1913. She was appointed vice-chairman and later became secretary of the Women's College Committee and chairman of the Advisory Committee, on which she served for 25 years. In 1927 she became the first woman to be named to the Board of Trustees of the University of Delaware. Fifty years ago Mrs. Warner helped found the State Federation of Women's Clubs, and was its first president. She assisted in founding the Associated Charities, now known as the Family Society. Her efforts have been recognized by naming for her one of Wilmington's Junior High Schools and Warner Hall at the University of Delaware.

WILLIAM O. JOHNSON, partner in the firm of Johnson & McCauley, concrete block manufacturing concern in Seaford, Del., died suddenly on May 14 while trying to stop a rolling automobile. He was 84 years old.

RICHARD W. HUGHES, who had been in the slate business in Delta, Penn., for a number of years before his retirement several years ago, died on May 2 at the age of 79.

BENEDICT A. SHEA, district sales representative, Keystone Cement Co., Yonkers, N. Y., died May 16 at the age of 53.

C. L. SPRINGER, founder and operator of the Springer Concrete Co., Buffalo, N. Y., until his retirement nine years ago, passed away May 24. He was 74 years of age. When he retired, Mr. Springer turned over control of the company to his son-in-law, Wilbert C. Ritchie.

LIVINGSTON BRUNS YOURTEE, general manager of the Yourtee-Roberts Sand Co., Chester, Ill., died suddenly on May 3 at his home in Lake Providence, La. He was 46 years old. At the time of his death he was engaged in directing the pumping of sand in the river in Arkansas and Louisiana.

EDWARD A. ROGGE, operator of a concrete block plant in Marinette, Wis., for 25 years, died unexpectedly on May 10. He was 71 years old.

WILLIAM J. MUHLITNER, president of the Great Lakes Foundry Sand Co., Detroit, Mich., passed away on May 10.

MRS. BUCKBEE, wife of J. C. Buckbee, a member of the board of directors of the Saticoy Rock Co., Ventura, Calif., passed away recently after a long illness. Mr. Buckbee had been chief executive officer of the Consolidated Rock Co. some 18 years ago.

Quarry and Mine Safety Awards

"SENTINELS OF SAFETY" trophies, signifying outstanding safety achievements in 1947, have been awarded to the leaders in six classes of mineral operations attaining the best accident records in the 23rd annual National Safety Competition under the auspices of the Bureau of Mines, according to Bureau Director James Boyd. One of the trophies went to the Dolonah dolomite quarry of Tennessee Coal, Iron & R. R. Co. at Bessemer, Ala., for working 297,246 man-hours without a lost-time accident.

Certificates of Achievement in Safety also were awarded by the Bureau to 96 mines and quarries for above-average safety performances during the year. Mines operated without a disabling injury during 1947 were: Ironton cement-rock mine, Ironton, Ohio, operated by Alpha Portland Cement Co.; Crystal City silica mine, Crystal City, Mo., operated by Pittsburgh Plate Glass Co.; Hanover gypsum mine, Hanover, Mont., operated by Ideal Cement Co.; and Crestmore limestone mine, Riverside, Calif., operated by Riverside Cement Co.

Quarries operated during 1947 without a disabling injury include the following:

Billmeyer dolomite quarry at Bainbridge, Penn., Ohio dolomite quarry at Millersville, Ohio, Inwood limestone quarry at Inwood, W. Va., Thomasville limestone quarry at Thomasville, Penn., and Blue Mount trap-rock quarry at Blue Mount, Md., all operated by the J. E. Baker Co.;

Hanover limestone quarry at Hanover, Penn., Steelton limestone quarry at Steelton, Penn., Naginey limestone quarry at Naginey, Penn., and Bethlehem limestone quarry at Bethlehem, Penn., all operated by Bethlehem Steel Co.;

Dixon limestone quarry at Dixon, Ill., and Sylvania limestone quarry at Sylvania, Ohio, both operated by Mead's Portland Cement Co.;

Jensen and Henshaw limestone quarries at Riverside, Calif., and Klondike limestone and shale quarry at Oro Grande, Calif., both operated by Riverside Cement Co.;

St. Stephens limestone quarry at St. Stephens, Ala., Birmingham limestone quarry at Birmingham, Ala., Nazareth cement-rock quarry at Nazareth, Penn., Greencastle limestone quarry at Greencastle, Ind., Lone Star limestone quarry at Hudson, N. Y., Bonner Springs limestone quarry at Bonner Springs, Kan., and Dallas limestone quarry at Dallas, Texas, all operated by Lone Star Cement Corporation;

Oglesby limestone and shale quarry at Oglesby, Ill., Marquette limestone quarry at Cape Girardeau, Mo., and Earlham limestone quarry at Earl-

ham, Iowa, all operated by Marquette Cement Mfg. Co.;

Hudson limestone quarry at Hudson, N. Y., and Northampton cement-rock quarry at Northampton, Penn., both operated by Universal Atlas Cement Co.;

Frazier limestone quarry at East Fultonham, Ohio, operated by Pittsburgh Plate Glass Co.; La Salle cement-rock quarry at La Salle, Ill., operated by Alpha Portland Cement Co.; Margerum limestone quarry at Margerum, Ala., and Birmingham cement-rock quarry at Birmingham, Ala., both operated by Alabama Asphaltic Limestone Co.; Clinchfield limestone quarry at Clinchfield, Ga., and Winterset limestone quarry at Winterset, Iowa, both operated by Pennsylvania-Dixie Cement Corporation;

Fogelsville limestone and cement-rock quarry at Fogelsville, Penn., Mason City limestone quarry at Mason City, Iowa, Gay limestone and shale quarry at Fordwick, Va., Iola limestone and shale quarry at Iola, Kan., Cloverbank shale quarry, Buffalo, N. Y., Sandt's Eddy cement-rock quarry at Martin's Creek, Penn., Alsen limestone quarry at Alsen, N. Y., and Union Bridge limestone quarry at Union Bridge, Md., all operated by Lehigh Portland Cement Co.;

Rock Hill trap-rock quarry at Quakertown, Penn., Winchester trap-rock quarry at Winchester, Mass., and Auburn limestone quarry at Auburn, N. Y., all operated by The General Crushed Stone Co.; Lawrence limestone and shale quarry at Fitzhugh, Okla., Okay limestone quarry at Okay, Ark., and Portland limestone and shale quarry at Portland, Colo., all operated by the Ideal Cement Co.;

Greencastle No. 2 limestone quarry at Greencastle, Ind., operated by Ohio and Indiana Stone Corporation; Keenport limestone quarry at Logansport, Ind., Holland limestone quarry at Holland, Ohio, Bellevue limestone quarry at Bellevue, Ohio, and Bloomville limestone quarry at Bloomville, Ohio, all operated by The France Stone Co.;

Permanente limestone quarry at Permanente, Calif., operated by Permanente Cement Co.; Hercules cement-rock quarry at Stockertown, Penn., operated by Hercules Cement Corporation; Nazareth limestone quarry at Nazareth, Penn., operated by The Nazareth Cement Co.; Thomaston cement quarry at Thomaston, Me., and Thomaston lime quarry at Thomaston, Me., both operated by Lawrence Portland Cement Co.;

No. 3 cement-rock quarry, West Coplay, Penn., operated by Coplay Cement Mfg. Co.; Diamond limestone quarry at Middle Branch, Ohio, op-

erated by Diamond Portland Cement Co.; National City gypsum quarry at National City, Mich., operated by National Gypsum Co.; No. 4 trap-rock quarry at Knippa, Tex., operated by Southwest Stone Co.; Fredonia limestone quarry at Fredonia, Kan., operated by Consolidated Cement Corp.; Celina limestone quarry at Celina, Ohio, operated by The John W. Karch Stone Co.; Evansville cement-rock quarry at Evansville, Penn., operated by Allentown Portland Cement Co.; and Rochester limestone quarry at Rochester, Minn., operated by Rochester State Hospital.

A.F.A. Vice-Chairman

JOHN R. WARK of the sales department of the Queen City Sand and Supply Co., New York, N. Y., has been elected vice-chairman of the Western New York Chapter of the American Foundrymen's Association. He has also served as a director. Martin J. O'Brien, Jr., assistant works manager of Symington-Gould Corp., Depew, N. Y., has been named chairman to succeed Elliot R. Jones, plant superintendent of Lumen Bearing Co., Buffalo, N. Y., who has been named a director for one year.

50th Anniversary

FREDERICK O. EARNSHAW and his wife celebrated their 50th wedding anniversary on June 16 at the Youngstown Country Club. Mr. Earnshaw retired as president of The Carbon Limestone Co. in March of this year after 30 years of service with the company. He is president emeritus of the Pennsylvania Stone Producers Association and past president of the National Crushed Stone Association, of which he is still a director.

Assistant Superintendent

H. A. CORRE has been appointed assistant superintendent in general charge of mine operations at the Bellefonte plant of Warner Co., Philadelphia, Penn., working under the direction of Cap. Koski, superintendent. CARL ZONG has been appointed production and maintenance foreman of mine operations.

N.I.S.A. President

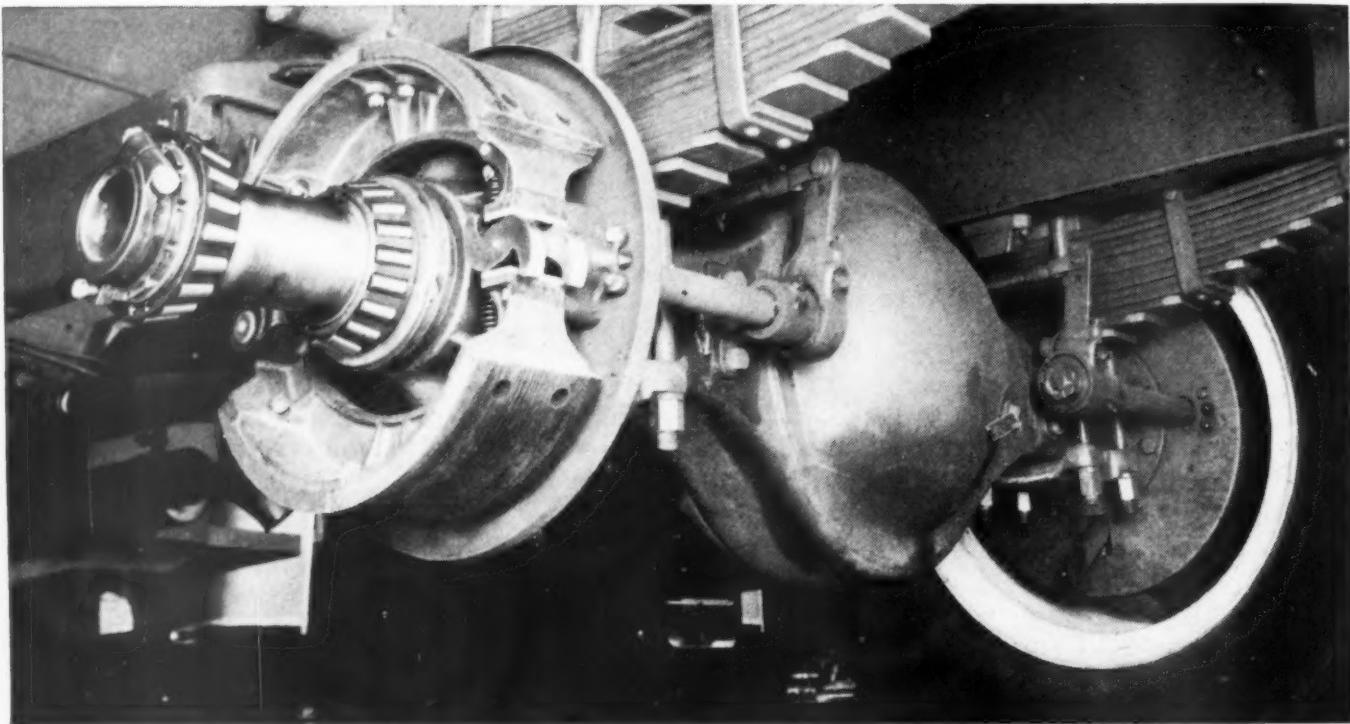
GEORGE A. THORNTON, vice-president of the Ottawa Silica Co., Ottawa, Ill., has been elected president of the National Industrial Sand Association, succeeding A. Y. Gregory, executive vice-president and assistant general manager of Whitehead Bros. Co., New York, N. Y.

Secretary Resigns

EARL GARDNER has resigned as secretary of Consolidated Rock Products Co., Los Angeles, Calif., and will be succeeded by Sidney F. Whaley who has been assistant secretary and office manager. Mr. Gardner resigned because of poor health and a desire to do some traveling.

REDUCE CHASSIS AND WHEEL BEARING MAINTENANCE COSTS

Get extra hundreds of miles
of protection between overhauls
with Texaco Marfak and
Texaco Marfak Heavy Duty.



MORE than 275 million pounds of Marfak have been sold!

DOWN come chassis maintenance costs when you use Texaco Marfak to lubricate spring shackles, steering knuckles, universal joints and propeller shaft bearings. Texaco Marfak assures—

1. *Lasting protection*—Texaco Marfak stays in the bearing under heavy loads and rough service. Parts get better protection, last longer—yet fewer applications are necessary.
2. *Rust prevention*—Texaco Marfak acts to seal out both dirt and moisture. Ordinary road splash won't wash it out. In addition, it has the property of keeping moisture off metal, preventing rust.

In wheel bearings, use Texaco Marfak Heavy Duty. It seals itself in...seals out dirt and moisture. And be-

cause it stays *in* the bearings, it stays *off* the brakes—an important safety factor. It's a year 'round lubricant, too—no seasonal repacking is required.

Let a Texaco Lubrication Engineer help you with *all* your lubrication and tell you about the Texaco Simplified Lubrication Plan. Just call the nearest of the more than 2500 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

2 MORE PLACES TO REDUCE COSTS

Keep Diesel and heavy-duty gasoline engines clean by lubricating with Texaco Ursa Oil X**. It's fully detergent and dispersive...assures trouble-free operation, maximum efficiency, minimum fuel costs.

Protect track rolls from dirt and moisture with Texaco Track Roll Lubricant. It seals out contaminants, assures longer bearing life.



TEXACO Lubricants and Fuels

Tune in...Texaco Star Theatre every Wednesday night featuring Gordon MacRae and Evelyn Knight...ABC Network



INDUSTRY

news

Start Power Plant Work For New Cement Mill

THE ARIZONA PORTLAND CEMENT Co. has started construction of the power plant that is to be a part of the new plant going in at Rillito, Ariz. This is about 18 miles west of Tucson, Ariz. The plant is located on the Southern Pacific Railroad and close to the major state highways in the area. The plant will use a 9½-x 350-ft. Allis-Chalmers dry-process kiln, and is expected to have a capacity of 200 bbl. of cement per day.

Some of the details of the plant's construction are still being worked out by the company's engineering staff, but the plant is to be very modern and will help relieve the shortage of cement in the area being served. A Pennsylvania Impactor and Cottrell dust collection equipment have been ordered.

Officers of the new company are all familiar to those close to the cement industry in southern California. They are: E. E. Duque, president; L. E. Bancroft, vice-president, and Archie L. McCall, secretary and treasurer.

Investigate Dredging Operations

AN INVESTIGATION has been undertaken in Buffalo, N. Y., by the International Joint Commission, to determine whether present dredging operations on Strawberry Island in the Niagara river by the Lakeside Sand & Gravel Corporation endanger the island's use as a protective barrier against the shifting of polluted waters from the American to the Canadian side of the river. Lakeside Sand & Gravel Corporation is a subsidiary of the Buffalo Gravel Corporation.

Produces Ag Lime

FORT DODGE LIMESTONE Co. will begin operations shortly at LeMars, Iowa, for the production of agricultural limestone and gravel. Tests indicate that the limestone deposit contains enough material for approximately two years.

Quarry Expansion

RIB MOUNTAIN GRANITE Co. QUARRY, Maine, Wis., has launched a new expansion program which will include the opening of two more granite pits on the company's 190-acre tract near the Marathon - Lincoln county line.

Four derricks, with electrically-operated hoists, have been purchased, and the present tool shed at the quarry is being moved to a new location. Charles F. Prehn is general manager of the company.

Construct Gypsum Plant

PRODUCTION of gypsum and gypsum board products for distribution throughout the Western United States is underway at Western Gypsum Co.'s new Sigurd plant, Sigurd, Utah, it has been announced by company officials. Western Gypsum Co. was formed and is managed by Utah residents, with financial interest on the part of Certainteed Products Corp., Ardmore, Penn. Directors from both Certainteed and Western Gypsum made a special trip to Sigurd to witness the beginning of operations. A fleet of large Diesel burning quarry trucks will carry some 500 tons of rock per day from the quarry, just northeast of Sigurd. The rock averages approximately 97 to 98 per cent in purity.

Whiting Company Destroyed by Fire

DAMAGE, estimated at more than \$50,000, was caused by a fire at the Reliance Whiting Co. plant in Alton, Mo. In addition to several buildings and the firm's rock crusher, a large quantity of finished whiting was destroyed, Charles E. Hermann, president of the company, reported.

Dismiss Suit Against Sand and Gravel Firm

OPERATIONS are being continued, under certain conditions, at a sand pit in the vicinity of Penfield, N. Y., owned by John E. Redman Sand & Gravel Corp., following discontinuation of an injunction suit begun last July by the Town of Penfield against the sand and gravel concern. The town sued to enjoin alleged violation of its zoning ordinance. On stipulation of attorneys the suit was dismissed. John E. Redman is president of the Sand & Gravel Corp.

Expands Talc Mill

INTERNATIONAL TALC Co., Gouverneur, N. Y., is expanding its No. 6 mill at Hailesboro to increase productive capacity, it has been announced. Additional crushing equipment and other units in conjunction with the talc grinding process are being added, and a 7-day week schedule will be instituted. Primary purpose for the changes is to offset part of the loss in production resulting from a recent fire which completely destroyed the No. 3 mill in Hailesboro.

Lease Stone Quarry

MOLAND BROS TRUCKING Co., Stevens Point, Wis., has entered into an agreement with the city to lease a stone quarry building and adjoining property from the city, with option to purchase after a 10-year period.



Exhibit of the Federal Portland Cement Co. which attracted considerable attention at the recent Buffalo Industrial Progress Exposition in Buffalo, N. Y.

NEWS

A.S.T.M. Cement Committee Spring Meeting

COMMITTEE C-1 ON CEMENT, of the American Society for Testing Materials, held its spring Meeting February 27-28 in Denver, Colo., following the annual meeting of the American Concrete Institute. Reports of the several working subcommittees included: progress in formulating a direct method for determining aluminum oxide in cement; summary of various methods of tests for reactivity of aggregates in mortar and concrete; and progress on a cooperative investigation of the relative value of the tensile compressive and flexural strength tests of the latter in predicting the flexural and compressive strengths of concrete.

The Working Committee on Additions presented a new definition of the term "addition," referring also to the revised definition of the term "admixture" adopted by Committee C-9 on Concrete and Concrete Aggregates, and a revision of the Specification for Portland Cement (C 150) was approved which will equalize the strength requirements at 7 and 28 days for both Type II and Type V cements. Also approved was the recommendation that a third type be added to the Specification for Air-Entraining Cement (C 175) which will apply to high early strength cement.

\$140,000,000 Magnesium Plant Sold

THE WAR ASSETS ADMINISTRATION has announced disposal of its \$140,000,000 magnesium plant at Henderson, Nev., to the State of Nevada, at a sale price of \$40,000,000. The state, acting through the Colorado River Commission, will pay \$1 upon transfer of the property and will turn over to the federal government all net revenues obtained from operation or lease of the plant for the next 20 years, or until the purchase price is paid.

Pavement Yardage

AWARDS of concrete pavement for the month of May and for the first five months of 1948 have been announced by the Portland Cement Association as follows:

	Square Yards Awarded During	During First May, 1948	May, 1948
Roads	3,186,943	11,038,915	
Streets and Alleys	1,927,560	6,830,635	
Airports	9,883	740,881	
Total	5,124,386	18,610,431	

Opens Agstone Plant

NEOSHO VALLEY ROCK CO., Burlington, Kan., has started the production of agricultural limestone, with a capacity of approximately 200 tons of

lime per each 10-hour day. Frank J. Pecka and sons, Frank, Jr., and Milo, organized the company.

Well tests made over 40 acres of the Pecka farm indicate a ledge of limestone —2 to 15 ft. in depth over the entire area tested, and Mr. Pecka estimates the supply to last 40 years, producing 40,000 tons per year. Tests on the lime show a 97.2 calcium content.

Sand and Gravel Plant Opened

MUELLER SAND AND GRAVEL PLANT, Hanover, Kan., will go into full scale operation in a short time, furnishing all grades of washed road gravel, concrete sand, building sand and plaster sand. Charles and Emil Mueller constructed the plant. Emmert Rowland is foreman.

Coming Conventions

July 8, 1948—

National Crushed Stone Association, Directors' Meeting, The Homestead, Hot Springs, Va.

July 16, 1948—

National Agricultural Limestone Association, Inc., Directors' Meeting, Hotel Bismarck, Chicago, Ill.

July 16-24, 1948—

American Road Builders' Association, Exposition of new Construction Equipment, Soldier Field, Chicago, Ill.

September 20, 1948—

National Ready Mixed Concrete Association, Directors' Meeting, The Broadmoor, Colorado Springs, Colo.

September 22, 1948—

National Sand and Gravel Association, Directors' Meeting, The Broadmoor, Colorado Springs, Colo.

October 18-22, 1948—

National Safety Congress and Exposition, Stevens Hotel, Chicago, Ill.

October 20, 1948—

American Institute of Mining and Metallurgical Engineers, Industrial Minerals Conference.

October 20-22, 1948—

National Industrial Sand Association, Semi-Annual Meeting, The Green-

brier, White Sulphur Springs, W. Va.

February 1-4, 1949—

National Ready Mixed Concrete Association, 19th Annual Convention, Hotel New Yorker, New York, N. Y. There will be no exhibit.

February 1-4, 1949—

National Sand and Gravel Association, 33rd Annual Convention, Hotel New Yorker, New York, N. Y. There will be no exhibit.

February 7-9, 1949—

National Crushed Stone Association, 32nd Annual Convention, Hotel New Yorker, New York, N. Y. There will be no exhibit.

February 13-17, 1949—

American Institute of Mining and Metallurgical Engineers, Annual Meeting, San Francisco, Calif.

January 22, 1950—

National Sand and Gravel Association, 34th Annual Convention and Exhibit, Stevens Hotel, Chicago, Ill.

Week of

January 22, 1950—

National Ready Mixed Concrete Association, 20th Annual Convention and Exhibit, Stevens Hotel, Chicago, Ill.

Week of

January 29, 1950—

National Crushed Stone Association, 33rd Annual Convention and Exhibit, Stevens Hotel, Chicago, Ill.

NEWS

Ohio Lime-Spreading Demonstration

THE PROCESSED LIMESTONE ASSOCIATION and the Departments of Agronomy and Agricultural Engineering of the Ohio State University in June sponsored a lime-spreading demonstration and clinic at Marion, Ohio. Purpose of the demonstration was to encourage all-season use of liming materials, to encourage satisfactory spreading by more local dealers, and to encourage cooperation between the producers of liming materials and the manufacturers of spreading and hauling machinery.

Activities got underway on the evening of June 28 with a dinner held in Marion for members of the Processed Limestone Association, manufacturers and salesmen of spreaders and equipment, salesmen and haulers, radio and press, and members of the Agricultural Extension Service and Agricultural Experiment Station Staff.

G. W. Volk, Department of Agronomy, Ohio State University and Ohio Agricultural Experiment Station, spoke on "Liming Ohio's Acid Soils"; W. E. Krauss, associate director, Ohio Agricultural Experiment Station, discussed, "Future Programs of the Ohio Agricultural Experiment Station"; and brief talks were given by A. H. Smith, County Agricultural Agent at Marion, and Calvin Baldinger, chairman, Board of Supervisors, Marion County Soil Conservation District. General discussion followed a film entitled, "The Other Side of the Fence."

On Saturday, manufacturers of lime spreaders and machinery for handling liming materials demonstrated their equipment, and exhibits were set up on "Benefits of Thorough Liming," "Liming Materials as Defined by Ohio Lime Law," "Spreading Liming Materials All Year," and "Increased Use of Liming Materials in Ohio."

Granted Contract for Road Improvement

GARNETT ROCK CO., Pleasant Hill and Harrisonville, Mo., has been granted a contract to furnish West Dolan Township with rock for its \$50,000 road improvement project. The Garnett company will operate a rock quarry in that vicinity, and expects to complete the work by the middle of September.

Rock Companies Merge

SERVICE ROCK CO., Riverside, Calif., has announced a merger with the Concrete Rock and Sand Co. which it purchased in 1943. Service Rock is headed by P. M. Hayden and Stewart L. Adler.

Purchase Gravel Plant

PURCHASE of a modern gravel crushing plant for the city pits, costing \$17,820, has been approved by the

city council of Manitowoc, Wis., despite a protest that records of work done at the pit the past two years indicated the new plant would stand idle much of the year. New territory annexed to the city is expected to cause an increased demand for gravel, however.

Up Cement Output to 3,000,000 Bbls.

NEW FACILITIES and improvements at the Tampa plant of the Florida Division of General Portland Cement Co., now nearing completion, are expected to enable the Florida Division to produce approximately 3,000,000 bbls. of various types of cements per year, according to Smith W. Storey, president.

Reopen Quarry

MARTIN BUSTAD, quarry operator in Austin, Minn., has reopened a limestone plant near LeRoy, Minn., formerly operated by Fowler and Pay. The new firm will be known as the LeRoy Lime Produce Co., with Oscar Ellefson as manager. The plant has been rebuilt to crush 400 to 500 cu. yd. of rock per day.

Opens Limestone Quarry

MIDWEST PRECOTE CO., Kansas City, Mo., has announced plans to open a limestone quarry south of Auxvasse, to furnish crushed stone for highway work, and pulverized limestone for farm customers. The Midwest Precote Co. recently was awarded contracts by the State Highway Commission for 28.9 miles of 20-ft. bituminous concrete surfacing of Highway 40 in the area. Contract price was \$574,467.

Find Quarry Properties Free from Dust Hazards

BUILDINGS, quarries and properties of The Cleveland Quarries Co. at North and South Amherst, Ohio, recently were found to be free from dust hazards in a survey conducted by The Industrial Hygiene Foundation of America, Inc., Pittsburgh, Penn. Both field and laboratory tests were made.

A. E. Tulk, president of The Cleveland Quarries Co., said that a great deal of attention is given to the preservation of the health of company employees and to working conditions within the properties.

\$250,000 Mine Sale

SALE of the Colorado Fluorspar Mines, Inc., properties near Salida, Colo., for \$250,000 to the Allied Chemical & Dye Corp., New York, N. Y., has been announced. The latter firm owns the Bellmont mill at Boulder, a mine at Jamestown and an acid plant in Denver. George Mussom, plant foreman at the Bellmont mill, has taken over active direction of the Salida mine.

Successful Safety Contests

TWO SAFETY CONTESTS are in progress at the Permanente Cement Co. plant, Permanente, Calif., Leonard R. Flicker, safety engineer, reports. The first, a "Sweepstakes," is an inter-departmental plant contest with 16 teams entered, all being approximately equal in accident exposure.

On a large bulletin board, the teams are represented by small metal horses, and for each week that a team goes without a lost time injury, its horse advances one space. At the end of 26 weeks all teams that have crossed the finish line are winners, and are entertained at a barbecue, dinner, or similar event.

The contest also features a "Safety Cigar" which is given to every plant employee each month the entire plant goes without a lost-time accident. The words, "Thanks, No Accidents Last Month," are printed on the wrapper.

In the second competition, an inter-company safety contest sponsored by "This Earth" magazine for the five companies the magazine represents, a perpetual trophy will be awarded to the company having the best record on a yearly basis, starting this year.

Contest 2 is based on a rating which is calculated by multiplying the accident frequency by the severity figure, on both a monthly and an accumulative basis. At the end of this year, the contest will be based on rate of improvement over the plant's previous record.

Represent 40 Foreign Countries at Road Show

ROAD BUILDERS from forty foreign countries are among the 40,000 members of the highway industry who will be present at the 45th Convention and Road Show of the American Road Builders' Association to be held in Chicago, July 16-24. According to Charles M. Upham, ARBA engineer-director, the July show will mark a new high in foreign attendance for the 39 years of Road Show history.

Launch Towboat

THE NEW VICTORY, third towboat of the same name built by Dravo Corporation for the same customer, has been placed in operation, towing sand, gravel and coal in the Pittsburgh area. This newest 1000-hp. towboat is 116-ft. long and in tests showed a thrust of 34,000 lbs. against the dock and 25,000 lbs. at a towing speed of 5 m.p.h. Radar equipment is used.

Senate Increases A.C.P. Funds

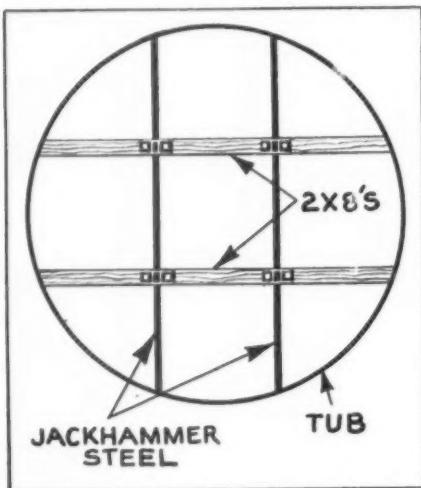
THE SENATE has voted 41 to 38 to increase the authorization for the 1949 Agricultural Conservation Program from \$225,000,000 as passed by the House, to \$300,000,000, it is reported.

HINTS and HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Hardening Drill Steel

AT the Neverson, N. C., quarry of Southern Aggregates, Inc., operated under lease by Bryan Rock &



"Slack" tub for tempering drill steel. Interior is divided to form support in holding drill steel upright

Sand Co., five churn drills operate in a group of three and two drills, respectively. At each drilling site a home-made blacksmith's furnace has been provided consisting of an oil barrel with suitable grate, air inlet, etc. The illustration shows one of the furnaces. Air to that furnace comes from a No. ½ Champion blower, driven off the gas engine assembly, with air conducted to the furnace through an old rubber inner tube.

When the Gill bits are heated to the proper temperature some of the mem-

bers of the drilling crew along with the blacksmith take hand sledges and shape the steel. These boys really pour it on with their double-jacks. After shaping and getting the cutting edge to the proper size it is trimmed with a cold cut and double jack.

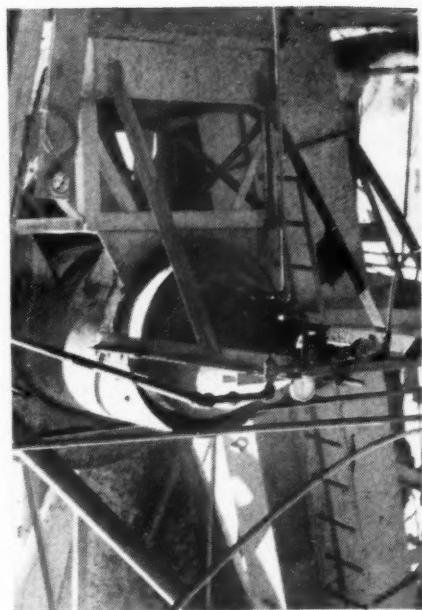
For tempering the sharp bits, each crew is supplied with several slack tubs designed so that the bit can stand almost vertical in the water. To do this, two pieces of 2- x 8's cut a trifle less than the diameter of the slack tub are pressed into the inside of the tub and about 8 in. apart. Across these two 2- x 8's, short pieces of jackhammer steel are spiked providing a rectangular opening. The 6-in. bit is then placed end-to-end in this opening. Cooling in this manner is said to be better than cooling by slanting the bit in the tub and letting it rest on the edge of the slack tank.

To provide air, the company has a 500 cu. ft. portable Blue Brute Worthington compressor augmented by a two-stage, Ingersoll-Rand stationary unit of 1000 c.f.m. capacity.

Oil Burner for Dryer

METHODS of "hooking up" an oil burner to a cylindrical dryer are of interest to many producers. In the preparation of bituminous road material, for example, the dryers are usually oil-fired, using steam to atomize the oil which is generally pre-heated.

In the illustration, the cylindrical combustion zone just ahead of the cone is lined with fire brick. The end of the Iowa dryer is simply opened



Showing how oil burner is supported

up and the burner is placed near the center and supported on a frame made up of angle iron brackets bolted to the dryer cylinder and its foundation support.

Making Equipment Portable

PORABILITY has been developed to a high degree in the southern phosphate fields of Florida. This is particularly true of equipment used in moving the "matrix" or crude ore to the washing plants.

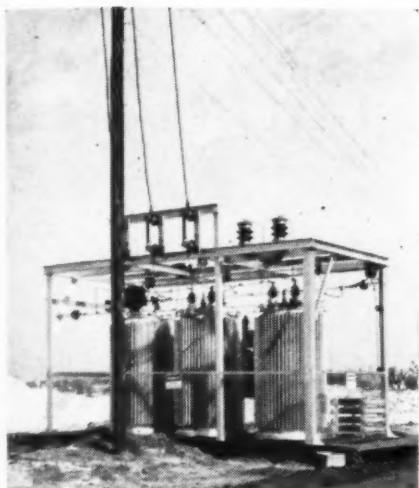
As the tonnage handled per day is extremely large and the depth of the



Left: Blower supplies air for home-made furnace. Center: Trimming the shaped bit with a "cold cut" and double jack. Right: Slack tub holds bit in upright position



HINTS AND HELPS



Transformer station is placed on skids for portability



Pump mounted on skid pumps tailings to settling pond

deposits in the 20- to 30-ft. range, large areas are mined over each month. Hence pumps and transformers are mounted on skids, some often of steel, so that the units can be moved from place to place as mining progresses. Incidentally, the electric transformers shown are supplying a.c. power to one of the largest draglines in the industry, a 21.4-cu. yd. Bucyrus-Erie unit. Alternating current delivered to the dragline is changed over to d.c. by the rotary converters on this huge machine. By using d.c. power, all brake bands and clutches are eliminated on the dragline.

Filler Plates for Bunker

SHAPE of the discharge section of a storage bunker should be taken into consideration in obtaining trouble-free performance, it has been suggested. The square bunker with a pyramidal discharge, while being inexpensive to construct, often causes material to hang badly. This is especially important where wet material is stored, as difficulty may be experienced in withdrawing supplies. Vibrating or tapping devices often are necessary to induce a satisfactory flow. Where such a bunker is used to store quicklime, inefficient design can cause financial loss as material may lie in the corners of the pyramid and deteriorate.

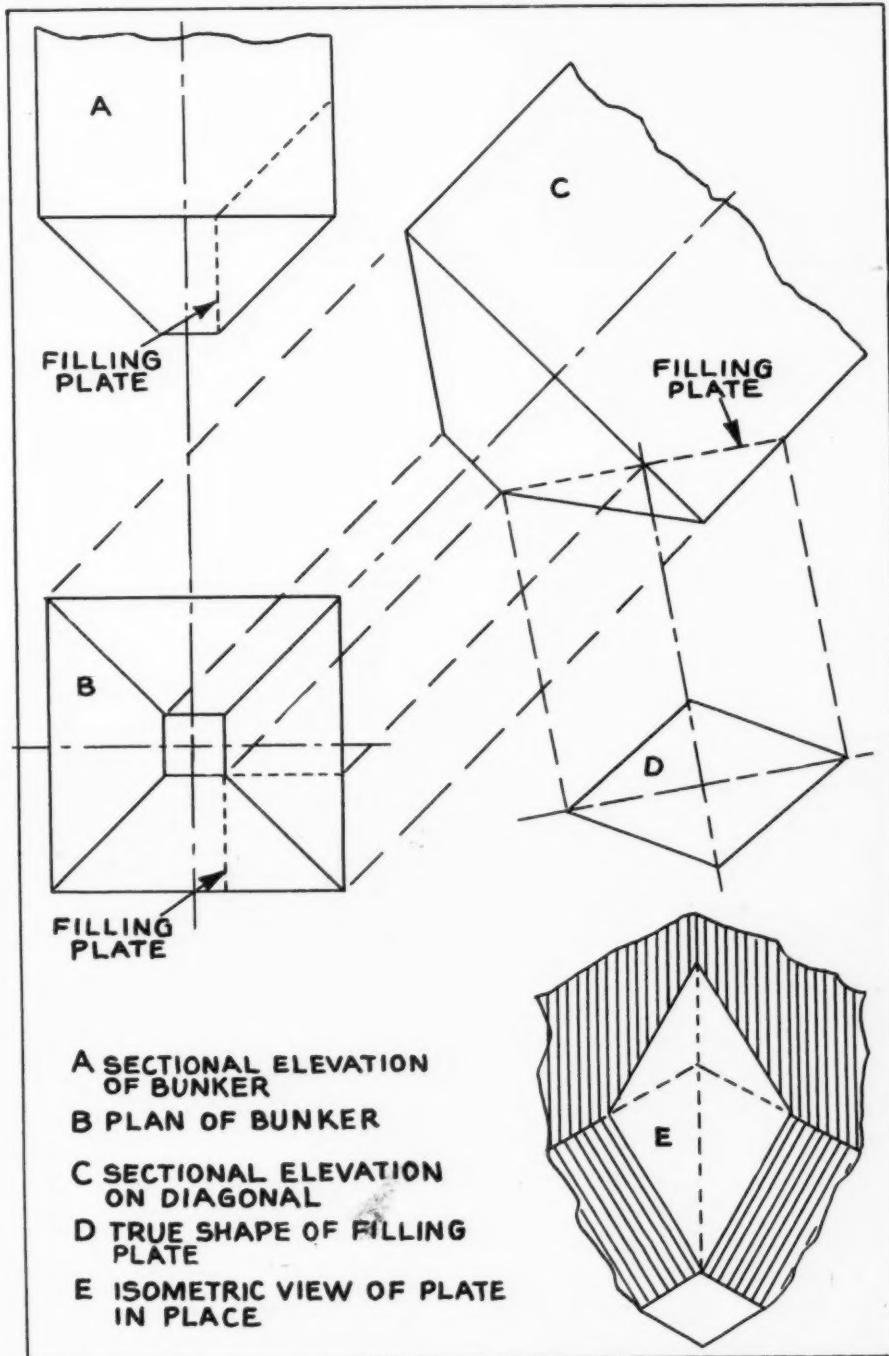
Bunkers of rectangular or square type can be improved for storing wet materials by insertion of a diamond-shaped plate in each corner, extending upwards from the discharge end, thus eliminating shallow corners by giving discharge section an octagonal shape.

In a typical case where a square bunker has a discharge angle of 45 deg., the corner angle has a slope of only 35 deg., but with the insertion of a diamond-shaped filling plate in each corner at a slope of 55 deg. the internal form is modified so that the minimum slope at any junction still is 45 deg.

In the illustration it will be noted that the junction of each lower edge of the filling plate with the existing

discharge slope is vertical when viewed from the opposite side. Here the slope of the pyramid is 45 deg., but modifications for other slopes can easily be made. In some cases however, filling plates will not be symmetrical as shown here.

Plates may be secured in place by welding or by lugs left on the plates and bent to the side contour for bolting. It is suggested that the spaces between the bunker sides and the added plates be filled with concrete to give support. The concrete may be inserted through openings provided by removing the apex of each plate. Volume of storage sacrificed by the alteration is exceptionally small in proportion to the improvement, it is said.



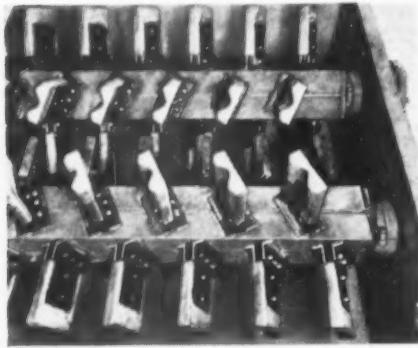
Details of bunker bin designed with filling plate to prevent materials from "hanging up" in the bin

new machinery

ROCK
PRODUCTS

Log Washer to Break Up Tough Clays

EAGLE IRON WORKS, Des Moines, Iowa, has designed a log washer for doing an improved job of scrubbing



Log washer has corrugated paddle shoes

coarse aggregate. Tough insoluble clay balls and cemented aggregates are broken down or worn out through greater abrading action.

More massive logs and larger, heavier tubs are among the new features. Deeply chilled, semi-steel renewable shoes are mounted on steel feet attached to welded fabricated angle steel logs to give a 36-in. tip-to-tip diameter. The design of the heavy duty shoes was worked out in cooperation with one of the largest aggregate producers in the country. The wearing surface is provided with corrugated sections to deliver a more severe scrubbing action. Other features include bottom wash water inlets, hardened gears and Hydrotex marine bearings at the lower end and Timken roller bearings at the upper end.

Channel Frame Conveyor

E. F. MARSH ENGINEERING CO., St. Louis, Mo., has announced a standardized channel frame conveyor composed of basic units which can be interchanged on many varied installations. Terminals and intermediate sections are pre-fabricated and factory assembled, then delivered direct from stock, clearly marked as complete, self-contained units, assuring proper alignment and simple erection.

Drive or head terminals (all sizes) are assembled around the basic 8-in. 11½ # rolled steel channel and are 8-ft. long. They are reinforced to provide strength and stability to the drive terminal. Standard stock head pulleys are 12-, 18-, 24-, and 30-in. Bearings are anti-friction. Tail or

take-up terminals are 8 ft. long and are available with 12-in. and 18-in. diameter pulley sizes for the four belt widths. Standard belt tension take-up screw is 16-in. long. Standard stock size intermediate stringers are 4, 8, 12, 16, and 20 ft. Sections are joined at the ends through heavy bar flanges forming a rigid joint.

Hightspeed Dozer

R. G. LETOURNEAU, INC., Peoria, Ill., has developed a fast 25-ton pusher dozer. Powered by a 300-hp. motor, the unit has four forward or reverse speeds and is capable of attaining speeds of 13.6 m.p.h. Steering clutches, brakes and transmission clutches are air actuated. The blade is electrically operated and can be raised 3-ft. 10-in. above ground. Blade control is a 240 volt, 120 cycle A.C. electric motor working through a gear reduction box. A spring-loaded, multi-

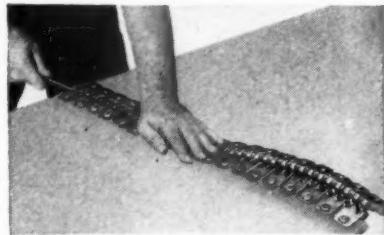


High speed 25 ton earth mover

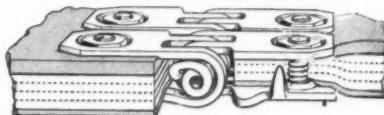
ple disc motor brake locks the blade in any desired position. Over-all dimensions are: width (blade mounted) 13-ft. 10-in.; length 19-ft. 7-in.; and wheelbase 7-ft. 6-in.

Separable Fastener For Conveyor Belts

FLEXIBLE STEEL LACING CO., Chicago, Ill., has developed a separable conveyor belt fastener called the Hinged

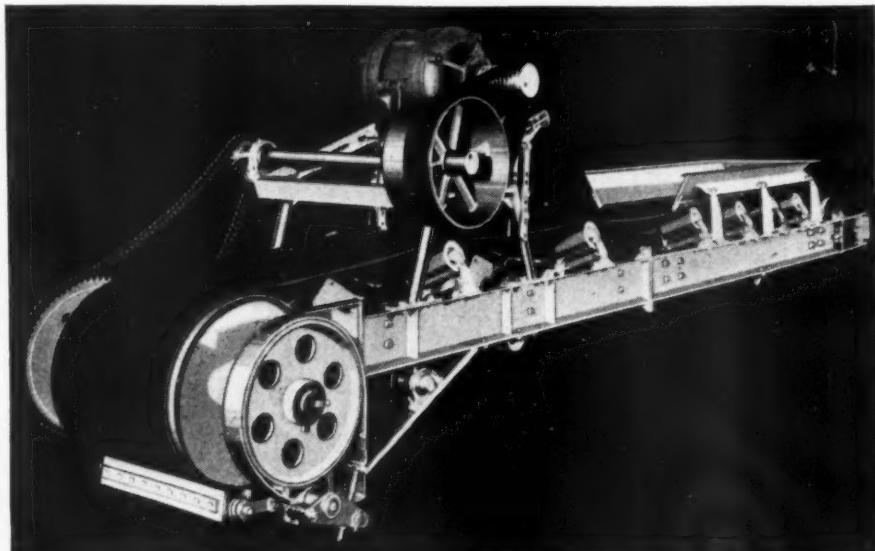


Separable conveyor belt fastener consisting of series of V-shaped galvanized plates



Diagrammatic view of separable fastener showing how U-shaped plates are bolted to each end of the belt

Fexco Belt Fastener. It consists of a series of U-shaped galvanized plates bolted to each end of the belt and joined together with a flexible hinge pin. It is made in one size for belts $\frac{3}{8}$ -in. to $\frac{1}{2}$ -in. thick. Features include: (1) the cutting of the belt ends in a concave arc; and (2) the hinge pin made of tightly wound spring steel that bends easily with the troughing of the belt and which is always readily removable because there are no small wires to fray out.

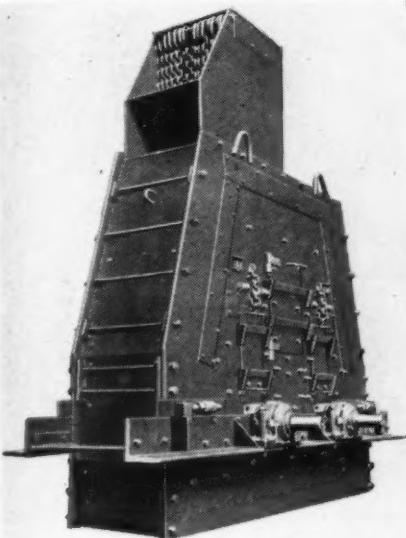


Section of standardized belt conveyor

NEW MACHINERY

Large Impeller Crusher

NEW HOLLAND MACHINE Co., New Holland, Penn., is now testing in a quarry its pilot Model 5050 double-



Pilot model of impeller crusher capable of taking stone passing a 50-in. square opening

impeller breaker. It is modeled after the Model 3030 breaker, and this unit also uses the principle of impact applied in suspension to reduce stone.

Taking any stone passing a 50-in. square opening, the Model 5050 is designed to produce aggregate in two sizes, minus 8-in. and minus 3½-in. It is 14 ft. high, 14 ft. long, and 9 ft. 4 in. wide. Mounted on 18-in. I-beam skids, 20 ft. long, the breaker weighs 93,500 lb., which is claimed to be much lighter than crushers handling comparable size stone.

Two impellers, which strike stone in mid-air in the breaking chamber, each weigh 13,400 lb., with bars. Each impeller has three pairs of 200-lb. bars. Impellers are capable of a maximum speed of 785 r.p.m. Each impeller will require a separate power unit capable of producing from 100 to 125 hp.

Heavy-Duty Trucks

FOUR WHEEL DRIVE AUTO Co., Clintonville, Wis., has announced a new model in the FWD line of heavy-duty four- and six-wheel drive trucks. This model, known as the ZU, is rated at 33,000 lbs. gross vehicle weight. It has an all-steel cab, and is provided with



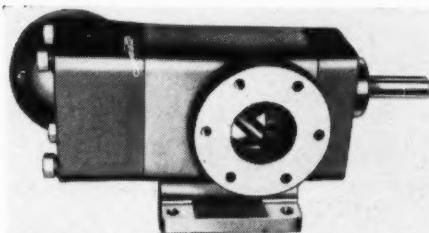
Four-wheel drive truck has front and rear axles of advanced design

a heavy diamond steel plating on top of the skirting and fender which provides a solid catwalk type of support for servicemen in adjusting the engine.

This model is powered by the 140 GZ, 554 cu. in. high compression gasoline engine which develops 188 hp. at 2600 r.p.m. governed speed and 460 ft. lbs. of torque at 1000 r.p.m. It has the "S" type constant mesh transmission with helical gears and sliding jaw clutches for easy shifting and quiet operation. The new vacuum operated center differential control lock has a finger tip control lever which locks or unlocks the free-acting center differential. A red indicator light located directly over the switch glows red while the differential is locked and switches off when the center differential is unlocked.

Helical Rotor Pumps

SYNTRON Co., Homer City, Penn., has just perfected a line of positive displacement helical rotor pumps. Two



Side view of new helical rotor pump, primarily designed for handling oil

helical rotors, one a driving rotor and the other an idler rotor, force the liquid ahead in an axial flow, maintaining both volume and pressure, according to the manufacturer. Built in two sizes, these pumps are primarily designed for handling various grades of oil at either 50 or 75 g.p.m. at pressures up to 125 p.s.i.

Intercommunication Systems

TALK-A-PHONE Co., Chicago, Ill., has announced an improved intercommunication system. These systems are coming into increasing use throughout the rock products industry, particularly among ready mixed concrete and concrete products plants. The latest development, known as the KRUL-40, DeLuxe, consists of one master station, which delivers a maximum of 2½ watts of voice-range power. Basic systems, comprising one master station and one sub-station, may be built up progressively, adding sub-stations as they are needed. Through the use of the master station, the superintendent or manager can communicate quickly with outlying departments, without going through the switchboard, thus effecting an economy in time and labor. Individuals can answer the general manager though they may be working as far away as 50 ft. from their sub-stations.

Large Capacity Pulverizer

LIPPMAN ENGINEERING WORKS, Milwaukee, Wis., has developed a large capacity pulverizer capable of producing 170 tons of agricultural limestone per hour: 90 to 100 per



High tonnage primary crusher particularly adapted for agricultural limestone production

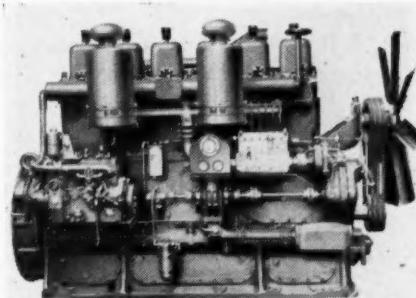
cent passing 8 mesh screen. Feed opening of the crusher is 22- x 50-in. and requires 320 hp. for high production.

Large Diesel Engine

WAUKESHA MOTOR Co., Waukesha, Wis., has announced the Model 6-LRD Diesel engine for electric power generation and operation of semi-portable construction equipment. The stripped engine is rated at 300 hp., at 900 r.p.m., or as a complete radiator cooled power unit, at 281 hp. at the same speed. Maximum output of the stripped engine is given as 330 hp. at 1050 r.p.m., and of the power unit, 301 hp. at 1050 r.p.m.

While the Model 6-LRD Diesel engine occupies approximately the same space as its gas engine counterpart, the Model 6-LRO, it is entirely new. The Diesel engine has a seven-bearing 5½-in. graphitic steel crankshaft, a one-piece casting cylinder block, and cylinders are of a special hardened alloy. Pistons are cast iron with six rings. A feature of the piston is the cooling of the piston crown by intermittent circulation of oil under pressure from the lubricating oiling system. It is said that the combustion chamber is designed to provide a lively, responsive acceleration, free from shudder and vibration.

The engine is equipped with large capacity waste-packed oil filters, fuel filters, built-in governor, American-Bosch injection system, and when so desired, it can be equipped with an individual gasoline engine mechanical starting system.



Large Diesel engine makes use of fuels in a wide octane range

NEW MACHINERY

Hydraulic Power Unit

HYDRO-POWER, INC., a subsidiary of the Hydraulic Press Manufacturing Co., Springfield, Ohio, has developed



Hydraulic power unit for mining and construction jobs

its Paul Bunyan, Jr., hydraulic power unit equipped with an air-cooled gasoline engine.

This gasoline engine equipped power unit, capable of supplying 3 gal. of oil per minute at 1000 p.s.i., can be taken to the job wherever it is located. The gear pump is mounted integrally with the operating valve which has a ball-handle lever operated at forward, neutral and reverse positions. Check and relief valves are built in the main valve body.

Belt-Carried Shot Firer

FARMERS ENGINEERING AND MANUFACTURING CO., Pittsburgh, Penn., has developed a 10-shot firer, light enough to be worn on the operator's belt



Shot firer designed to be carried on belt

which is said to offer sure-fire action combined with safety features.

The Femeo shot firer is capacitor operated, eliminating dependence on speed of operation for energy output. A sufficient charge to detonate one to 10 shots is transferred to two condensers and then to the explosive by use of a special safety key which it is claimed prevents the accidental discharge of condensers to the firing line. It weighs slightly over one pound, and is equipped with a belt hook which permits it to be carried under supervision of the person responsible for firing. However, shots can be fired without removing the shot firer from the belt. Other safety features include automatic dissipation of the charge if not used; recessed terminals; non-metallic, non-conducting case; and neon light which indicates when the unit is ready to fire.

Feeder-Conveyor Announced

LINK - BELT CO., Chicago, Ill., announces that its new "PA" oscillating, trough conveyor is now in production. This new conveyor is a positive-action,



Oscillating trough feeder-conveyor, available in lengths up to 100-ft.

roller bearing, eccentric type oscillating trough feeder-conveyor, driven by a Link-Belt Electrofluid drive through a chain or V-belt reduction to the feeder's eccentric shaft and connecting rod assembly. Advantages claimed for this trough-feeder are: no spillage of material being conveyed; low wear on trough; no joints or operating parts to be injured by abrasion; and ease of alignment due to entire unit being mounted on substantial H-beam sub-frame. Available in standard trough widths of 12- to 48-in., and in trough lengths up to 100-ft.

Compact Design Welder

LINCOLN ELECTRIC CO., Cleveland, Ohio, announces a new gasoline-powered portable welder primarily designed for compactness. This lightweight welder is reported to be very inexpensive. Known as the "Lincwelder," it is roughly 2 x 2 x 4 ft. and weighs less than usual equipment of similar type and size. Features of this welder are a current range from 20 to 180 amperes; provision for three ranges of output current; generator controls mounted in an enclosed cabinet above the unit; a 2-cyl-



Compact, lightweight, low cost welder, powered by air-cooled motor

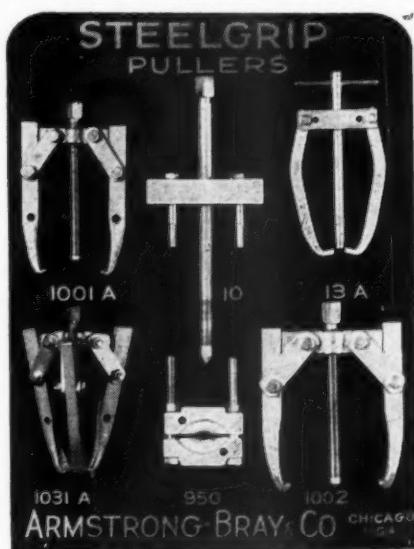
inder air-cooled Wisconsin motor with a speed range from 1800 to 2300 r.p.m., which determines the welding current.

Mobile Gas Turbine

ALLIS - CHALMERS MANUFACTURING CO., Milwaukee, Wis., has announced the development of a mobile gas turbine plant which will provide a compact, easily moved source of emergency electric current. Studies have been made of 3000 and 6000 kw. units to be mounted on railway trucks for rapid movement over normal railway track or comparatively irregular freight and utility yard tracks. The gas turbine plants would operate on oil, and would not require water. The prime mover of the 300-kw. unit operates on the simple gas turbine cycle with regenerator, and is coupled to a 3600 r.p.m. generator through a reduction gear.

Tool Rack

ARMSTRONG-BRAY & CO., Chicago, Ill., has designed a display board and tool rack for six of the Steelgrip pullers made by the company for the removal of gears, wheels and bearings.



Rack for holding six sizes of gear, wheel, and bearing pullers

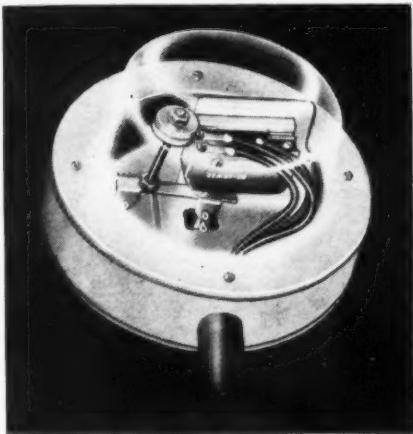
NEW MACHINERY

Portable Secondary Crusher

IOWA MANUFACTURING Co., Cedar Rapids, Iowa, has started production of a new portable crushing, screening plant embodying a cone crusher designed for secondary crushing of rock or gravel where material being fed is fairly uniform in size. It is reported best adapted to an operation requiring only one or two size reductions, and where fines are not particularly desired. This new plant consists of a 22-in. Symons pedestal-type cone crusher, a 42-in. x 10-ft. double-deck horizontal vibrating screen, plus necessary conveyors, chutes, drives, and hoppers. The truck is offered with either steel wheels or pneumatic tires.

Small Bin Level Indicator

THE BIN-DICATOR Co., Detroit, Mich., has brought out its Bantam Bin-Dicator which is designed for use on very small hoppers, spouts, chutes and conveyors. Its diameter is only 5½-in. Both standard and Bantam



Small size bin level indicator

units are diaphragm-operated switches in sealed housings which mount on the outside of bins, hoppers, screw conveyors, etc. They will automatically start and stop filling and emptying equipment as the level of the materials reaches designated limits.

Lime Slaker

THE DORR Co., New York, N. Y., has developed the Dorco slaker which was designed for continuous lime slaking plus classification and grit removal. It consists of two component sections, one for slaking and the other for classifying, washing and removing the grit.

The slaking compartment consists of a cylindrical tank, the sides and bottom of which are lined with white iron tank liners of 1-in. thickness. A mixer of the impeller type promotes rapid and intimate contact.

The classification compartment consists of a Dorr classifier of modified design with a flared tank which is joined to, and becomes an integral part of, the slaking compartment. The two compartments are connected by

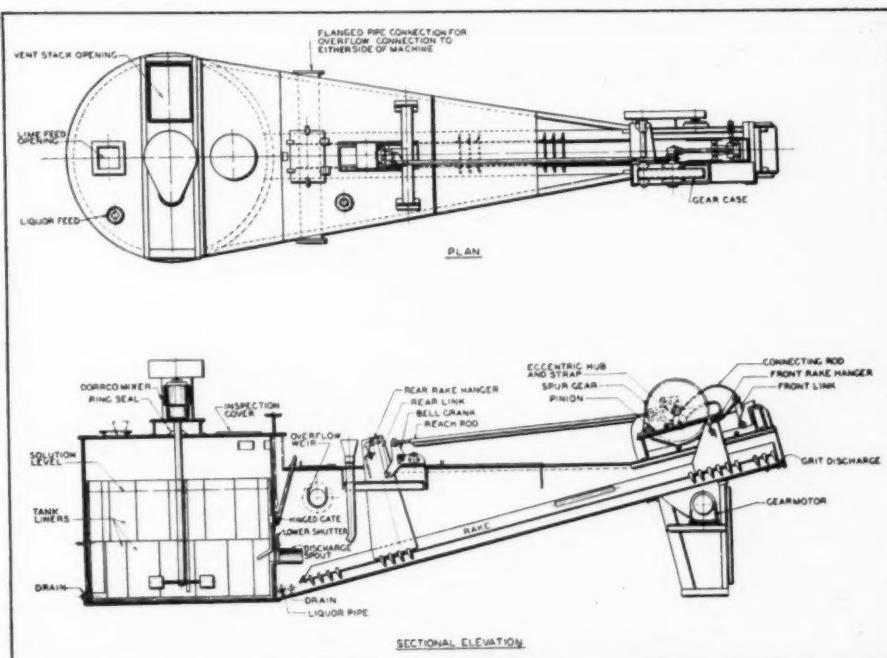


Portable secondary crushing plant with 22-in. cone crusher and 42-in. x 10-ft. 2-deck screen

means of two submerged ports in the shell of the slaking compartment which allow the passage of slurry into the classifier. Both these ports can be opened or closed by means of shutters controlled from outside the tank.

Operation of the slaker is simple and continuous. Lime and a portion of water or liquor are fed into the slaking compartment through suitable openings provided in the cover. The balance of the water or liquor is fed into the classification compartment, and its proportioning between the two compartments can be adjusted, within certain limits, to suit the particular requirements. After slaking, the slurry passes continuously through the submerged ports to the classification

section, in which quiescent conditions are maintained sufficient to permit material coarser than 65-mesh to settle out. The grit is raked up the inclined deck by the reciprocating classifier rakes and discharged at the upper end as a drained sand. A water spray near the upper end of the deck washes the grit before discharge. Degritted milk-of-lime overflows into the overflow launder which spans the classifier compartment. As both compartments of the slaker have a common hydraulic level, the operating level of the slurry in both sections of the slaker is established by the overflow launder. It is usually desirable to slake at a liquid-to-lime ratio of about 4:1 by weight.



Elevation and plan details of continuous lime slaker

ROAD SHOW EXHIBIT

AMERICAN ROAD BUILDERS' ASSOCIATION'S 45th annual Road Show opened an office at Soldier Field, Chicago, under the direction of Miss Louise Wynne, exhibit manager. H. A. Scribner, promotion committee chairman, announced recently that banners are available for mounting on equipment to be shipped to the show, reading: "See Me At The Road Show, July 16-24th, Soldier Field, Chicago." These banners are 40- x 60-in. in size, with white letters on a blue field.

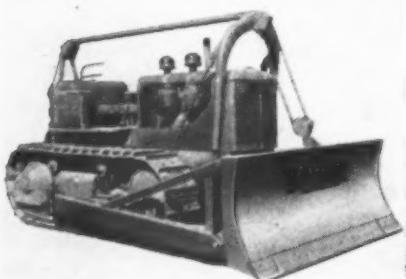
This gigantic exhibit, to cover almost 30 acres, will contain much equipment of prime interest to the rock products producer and allied industries. The following incomplete listing of booth displays is in addition to the more complete story appearing in the June issue of *ROCK PRODUCTS*, and includes those that were received too late for inclusion in that issue. Booth numbers are indicated in parentheses.

Exhibits

American Brake Shoe Co. (1614, 1024, 1225) Products from five divisions of this company will be exhibited: American Manganese Steel, National Bearing, American Forge, American Brakebloc, and Kellogg. Theme of company exhibits will be Punished Parts, which are supplied to the construction and allied industries for both original equipment and replacement. Of particular interest will be the exhibit of two Amsco manganese steel power shovel dippers, one of 2- and one of 1½-cu. yd. capacity.

Athey Products Corp. (3208) Three pieces of equipment never before exhibited by this company will be the PD-10, a rubber-tired quarry trailer fitted with single low-pressure tires for use with a Caterpillar DW10 tractor; a portable crusher unit, particularly designed for towing behind the "Force-Feed Loader"; and a new small capacity 2 ton "Forged-Trak" wheel for use over rough terrain. Additional equipment will round out the display.

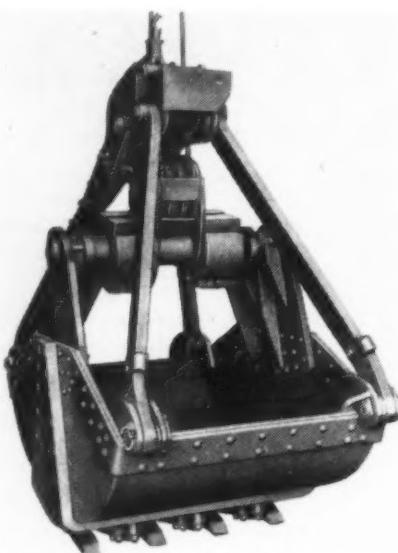
Baker Manufacturing Co. (3112) Equipment specially built for attachment to Allis-Chalmers HD-19 tractor



Exhibited for the first time, Baker Manufacturing Co.'s cable bulldozer mounted on an Allis-Chalmers HD-19 tractor

will be shown. Included will be new hydraulic and cable dozers, grade-builders, a giant ripper, and several cut-away models of various pieces of equipment.

Bay City Shovels, Inc. (3874) Exhibited will be model 65 shovel of 1½-cu. yd. capacity with a 20 ton crane rating and powered by a Cummins HRI-600 Diesel engine. The shovel attachment includes a 21-ft. boom and a 16-ft. dipper stick. To be shown also is the model 30 back-hoe, with a ½-cu. yd. shovel and rated as a 6 ton crane; and model 180-T66 CraneMobil, a rubber-tired 20-ton crane equipped to handle booms and jib up to 110-ft. This unit is powered by a Waukesha 6SRKR.



Popular size Erie Steel Construction Co. two-line clam shell

Brooks Equipment & Manufacturing Co. (3822) Featured will be the "Load Lugger," a hoisting mechanism with interchangeable containers that may be fitted to any standard truck chassis. Special containers are built for handling rock and air-entrained concrete.

Butler Bin Co. (3015) An entirely new design cement bin for a cement batching plant, recently developed by this company, will be shown. It is comprised of two bins with the roof of the lower forming the floor of the upper, thus utilizing space below the conventional type of batching plant and making possible storage of 533 bbl. of cement in a plant which is only 30-ft. high.

Erie Steel Construction Co. (3217) Various capacities of both "Hard Digger" and "Barge" type clamshell buckets will be displayed. Also shown will be the Strayer portable concrete plant in the 30- to 40-cu. yd. per hr. capacity in actual operation; with ramps constructed so that visitors may inspect each station of operation.



All-purpose materials handling unit produced in different styles and capacities by Brooks Manufacturing Co.

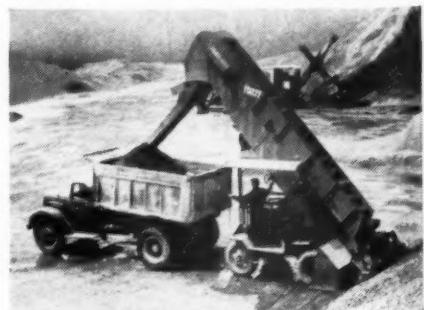
Four Wheel Drive Auto Co. — A new model with a rating of 33,000 lb. gross vehicle weight, including new design features, will be shown.

Gorman-Rupp Co. (3021) The complete new line of centrifugal self-priming pumps from the 7M, 2-in., to the 125M, 8-in., will be on display.

Harnischfeger Corp. (1412, 2202) In addition to a complete display of shovels, truck cranes, Diesel engines, soil stabilizers, etc., emphasis will be placed on a new complete repair-maintenance welding service, including two arc welders, completely self-contained for instant use in shop or field. Welder model WN-200 will be in actual operation, and is offered in either a trailer or skid model. It is powered by a four-cylinder, air-cooled engine and has a welding service range from 30 to 260 amperes. A feature of this welder is its extra a.c. power source of 110 volts for operating lights or electric tools.

Highway Equipment Co., Inc. (3223) A complete line of spreaders, for both clamping to regulation dump trucks or mounting on truck chassis, will be exhibited. Several models are particularly adapted to the spreading of agricultural limestone.

The Frank G. Hough Co. (2204, 2403) This exhibit, occupying 7000-sq. ft., will be the largest in company history. Two new products are to be displayed for the first time: the model HM Payloader, a completely new tractor shovel featuring all-wheel drive on large pneumatic tires, with 1½-cu. yd. bucket capacity, and the "Pick-up Street Sweeper." Also displayed will be the complete line of Hough equipment for mounting on International crawler or Case wheel tractors.



A Heiss model 80W rubber-mounted bucket loader loading from a stockpile

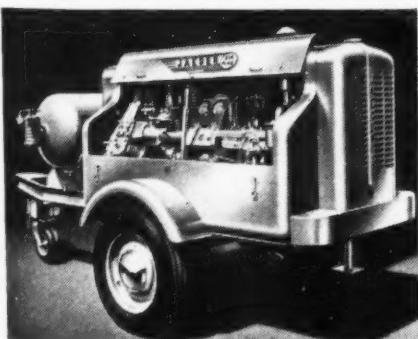
Independent Pneumatic Tool Co. (3602) Two Thor pneumatic tools will be exhibited for the first time, including the Thor wagon drill, features and details of which will not be released prior to the show. Other equipment includes a 75-lb. paving breaker, and the Thor backfill tamper.

Isaacson Iron Works, Inc. (2410, 2609) Occupying 10,000-sq. ft. of exhibit space, this company will display its complete line of tractor equipment. Located next to the large International Harvester display, particular emphasis will be placed on the fact that this company makes allied equipment for all models of International tractors, including the new TD-24. The exhibit will include a total of 15 units, containing more than 25 different Isaacson products.

Jaeger Machine Co. (3602, 3801) This exhibit will include the demonstration of a complete line of "New Standard" sizes of portable air compressors in 75, 125, 185, 250, 365, and 600 c.f.m. capacities, that replace the smaller conventional ratings. These compressors represent increases of 15 to 20 per cent in rated capacities over previous models, with no increase in over-all dimensions. Also to be shown are paving machines, hydraulically controlled hoists, dewatering and pressure pumps.

Joy Manufacturing Co. (3001) Six of the company's eight different sizes of new WK-80 series portable air compressors, rated from 60 to 630 c.f.m., will be on display. Also shown will be a complete line of "multi-purpose" single drum hoists and winches; both turbine and reciprocating air-driven models. A heavy duty WN-102 semi-portable air compressor with heavy transparent lucite plates will allow visitors to view the complete cycle of operation.

LaPlant-Cheote Manufacturing Co. (3205A, 3216, 3207A, 3218) Largest exhibit in this company's history will feature five tractor drawn scrapers, three of which will be standard cable controlled 6-, 8-, and 14-cu. yd. struck capacity models for use with conventional tractors. The other two scrapers will be hydraulically controlled models. Four models of the company's new self-propelled line will be on display, including the TD-300, a 4-wheel drive, 4-wheel steer dozer; the TW-



New 125 c.f.m. portable air compressor, one of six in series replacing smaller machines of the Jaeger Machine Co.

300, a 15-cu. yd. bottom dump wagon; the TS-200, a 9-cu. yd. motor scraper; and the TS-300, a 14-cu. yd. motor scraper. All of this equipment will be in actual operation.

R. G. LeTourneau, Inc. (3022, 3033) To be exhibited for the first time will be the new post-war equipment line of this company, including several all-new models. The "Tournadozer," to be presented for the first time, is a 4-wheel drive, rubber-mounted, cable-controlled dozer, capable of speeds up to 15 m.p.h. in both forward and reverse. The electric control, applicable to all LeTourneau equipment, will be emphasized at this exhibit, with one machine specially prepared for visitor operation. Other features to be stressed are instantaneous shifting, and a torque-proportioning differential.

Owen Bucket Co. (3834) A representative display of Owen clamshell buckets for all material handling and the Owen "Grapples" for handling rocks, scrap, etc., will be shown. In addition, a model of a grapple in constant use will attract visitors.

Pettibone Mulliken Corp., George Haiss Manufacturing Co., Inc. (2618A, 2618) Seven pieces of equipment will be exhibited, including Haiss portable trough conveyor, belt-type under car unloader, and model 80W wheel-mounted bucket loader; and Pettibone Mulliken speedloader, clamshell bucket, dipper, dragline bucket, and a portable batch asphalt plant.

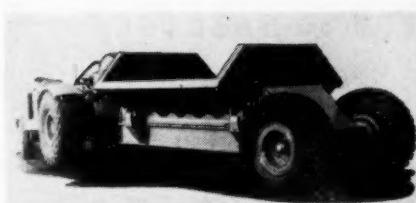
Quick-Way Truck Shovel Co.—Exhibited in conjunction with the International Harvester exhibit, will be both the "Quickway" models E and J, together with complete attachments for shovel, dragline, crane, trenchhoe, clamshell, pile driver, scoop and backfiller.

Sterling Machinery Corp. (1216) A complete line of self-priming centrifugal pumping units will be shown; also hoisting equipment, electric generating plants, and electric welders; plus various pieces of machinery utilizing this equipment.

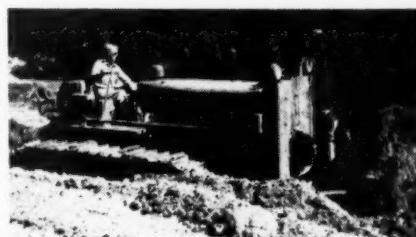
The Thew Shovel Co. (1020, 1221) Featured at this exhibit will be the new 20 ton MC414 "Moto Crane," a truck-mounted, fully revolving unit. This crane is to be driven from the manufacturer's plant at Lorain, Ohio, to the Road Show at Chicago, Ill.

White Motor Co. (3820) Two trucks of the most advanced design, for both on and off highway operation, will be demonstrated. Both units are powered by the White Super Power engine.

Wisconsin Motor Corp. (1017) The entire line of 4-cycle single cylinder, two cylinder and V-type four cylinder air-cooled engines will be on display. New models TE and TF 2-cylinder engines will be shown. Model TE has a displacement of 45.9-cu. in., 3-in. bore, 3 1/4-in. stroke, and a range from 1400 to 2600 r.p.m. Model TF, a slightly larger model of the same basic design and construction, delivers 8.6 hp. at 1400 r.p.m. and 13.3 hp. at 2600 r.p.m.



Rubber-tired, large capacity quarry trailer of the Athey Products Corporation shown with a Caterpillar DW10 tractor



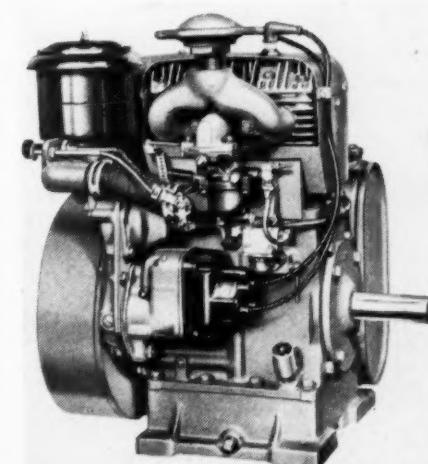
Adjustable angle blade of the Isaacson Tractor Equipment Co., mounted on an International TD-24 tractor



Self-propelled 14-cu. yd. LaPlant-Cheote "Motor Scraper"



An all-electric controlled model C. Tournapull of R. G. LeTourneau, Inc.



Cut-away model TE, 2-cylinder, air-cooled standard engine with side mount fuel tank, manufactured by Wisconsin Motor Corporation

Crushing



Belt conveyor, left foreground, takes throughs from two cone crushers and returns material to belt at right that serves screens ahead of cones

SOME unusually interesting blasting and crushing practices are followed at the new Neverson, N. C., plant of the Southern Aggregates Corporation. Constructed of steel and concrete, this modern granite crushing plant went into operation in November of 1946, producing about 300,000 tons annually of washed granite. Although it is only in its second year of operation some novel changes of first importance are planned for early installation. The plant, which is operated under lease by the Bryan Rock and Sand Co. of Raleigh, N. C., is located on the Norfolk & Southern Railroad one mile east of Bailey and about 40 miles east of Raleigh. At Neverson, the Southern Aggregates Corporation owns a large area of ground that has been carefully surveyed and topographic maps made with contour lines on close intervals. These maps are on file in the company's office at Raleigh.

Following a trend that has been noticeable in the Southeast for some time, the operators are planning to move the primary crusher to the present quarry floor. An old 48- x 60-in. jaw crusher will be replaced by a new Allis-Chalmers jaw crusher of the same size. Present intentions are to have two surge piles; one after the primary crusher operation and one after the third crusher reduction. The exact location of these surge piles is being given serious study because the primary will deliver a 10-in. material and reclaiming stone of this size from a surge pile may involve some novel operating techniques.

Granite being processed here is more coarsely crystalline than the granites from the several other operations of the Southern Aggregates Corporation. Its drilling rate with churn drills is slower than for granites in the area, and the rock shows a very satisfactory result (31 per

cent) when tested by the L. A. rattler test. It is an open quarry operation with from a few feet to 30 ft. of clay overburden. After this is removed a top slice is taken and if in stone is sent to the crushing plant but if debris, it is hauled to waste by 18-ton, rear-dump Euclid trucks. Strippings are loaded by a 2-eu. yd. Lima shovel. This top cut gives a clean top to an otherwise somewhat irregular surface. The quarry face at present is about 70 ft., and is being recovered in a single lift. At present two wagon drills are sinking a pit in the quarry floor to hold the new primary crusher installation. Until this is in, stone will continue to be hauled up the inclined roadway to the crusher where the stone is dumped directly into the crusher. In the new set-up a pan feeder of large dimensions and rugged construction will receive stone from a truck-dumping hopper. The company has seven Euclids in the rock and stripping hauls.

The general design of the new plant was worked out by M. N. Hedrick and Richard T. Lassiter, president and treasurer, respectively, of the Southern Aggregates Corporation, with W. E. Johnson doing the detailed planning. James E. Bryan is president of the operating company, the Bryan Rock and Sand Co., Inc. J. D. Lane is general superintendent of all the company's operations (a crushed stone plant at Wendell and one at Rolesville, N. C., and other operations). Granville Rogers is the operating superintendent at Neverson, and J. H. Watkins is general safety superintendent.

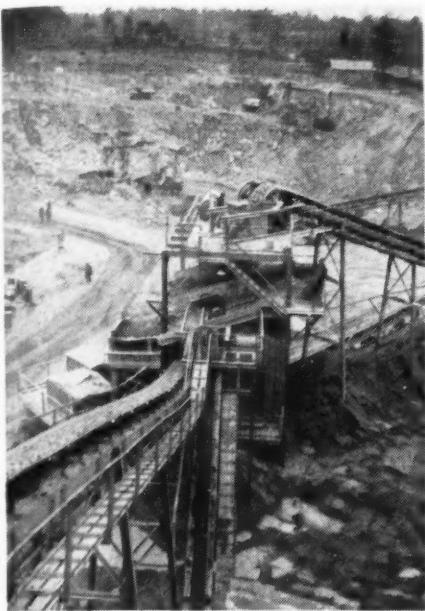


General view of plant: (A) conveyor from secondary crusher to cone crushers; (B) conveyor from cone crushers to final screening plant; (C) loading belt conveyor and to right is structure supporting rinsing screen

Cut Quarrying Costs With Two Surge Piles and Relocation of Crusher

Southern Aggregates Corporation, Neverson, N. C., plant, operated by Bryan Rock and Sand Co., making several changes in plant facilities to permit more continuous operation

By W. B. LENHART



Left: Belt in foreground is taking crushed granite from screens at cone crushers and delivering material to the final screening and washing section. Center: Belt No. 3 transports minus 5-in. from secondary crusher and the throughs from grizzly to screens ahead of cone crushers. Right: Each screen, above, serves a 4-ft. cone crusher



Drilling-Blasting Practice

Primary drilling is done by seven churn drills that at time of inspection were operating in two groups. In one group were three new Keystone "51's" with steel cables on the tools and the rigs all provided with crawler treads. At the second location were two older Armstrong rigs and two Sanderson-Cyclone rigs. Steel is sharpened at the place of use with each of the two groups of churn drills having a shop-made furnace and hand sharpening equipment. All wagon drill and jack-hammer steel is sharpened in a shop near the plant office. The Keystone drills are driven by individual Red Seal gas engines. The Armstrong's and Sanderson's are electric rigs. Gill bits are used on all drills and their diameter provides for a 6-in. hole. Drilling is at the rate of approximately 1½ ft. per hr.

Owing mainly to the present size of the quarry, 15 drill holes in a single row constitute the maximum number of holes shot at one time. Holes are drilled on the stripped off section to 5 feet below the quarry floor. The holes are on 24 ft. centers with 18-ft. burden. Each hole is loaded at the bottom with 600 lbs. of Hercules Powder Co.'s 5½- x 24-in. Gelamite "D," which is roughly equivalent to 70 per cent semi-gelatin dynamite. Then the hole is stemmed for 12 ft. after which 300 lb. of 5- x 24-in. Gelamite "B" is added and followed with approximately 10 ft. of stemming, which fills the hole up to the surface. Gelamite "B" corresponds approximately to 60 per cent semi-gelatin dynamite. The total load of explosive in each hole is thus 900 lbs. The loading is based on 3½ tons of stone to the pound of Gelamite, and the cost of this primary explosive is 4.4¢ per ton of stone

brought down. After the holes are loaded, two trunk lines of Cordeau-Bickford are laid parallel to the holes, one trunk being in front of the holes and the other trunk behind the holes. Busses from odd-numbered holes are connected to one trunk, and busses from even-numbered holes are connected to the other trunk. One set of holes is fired by an instantaneous electric cap; and the other set is fired by an "A" delay electric cap which has a delayed action of 25 milliseconds. This rather novel method of shooting gives excellent fragmentation in this stone. The larger shots are loaded under the direction of a representative of the Hercules Powder Co. All other blasting is under the direction of J. C. Watson, pit foreman.

An Ingersoll-Rand 1058 c.f.m. two-stage, electrically-driven stationary compressor and a 500 c.f.m. Worthington portable Blue Brute compressor furnish the air for sinking and secondary drilling. A 1250 c.f.m. Ingersoll-Rand two-stage, electrically-driven compressor has just been transferred from one of the other quarries and has been installed alongside of the 1050-foot machine.

Excavation-Haulage

Loading in the pit is done by two Northwest, 2½-cu. yd. Diesel-driven shovels. When primary and secondary shooting is done, this equipment is removed to the rim of the quarry. For quarry floor clean-up and other utility purposes about the place, an International Diesel tractor with dozer is on the job all the time. Any water that accumulates in the floor of the quarry (mostly from rains) is removed by a 4-in. gasoline-driven Jaeger "Sure Drive" portable pump.

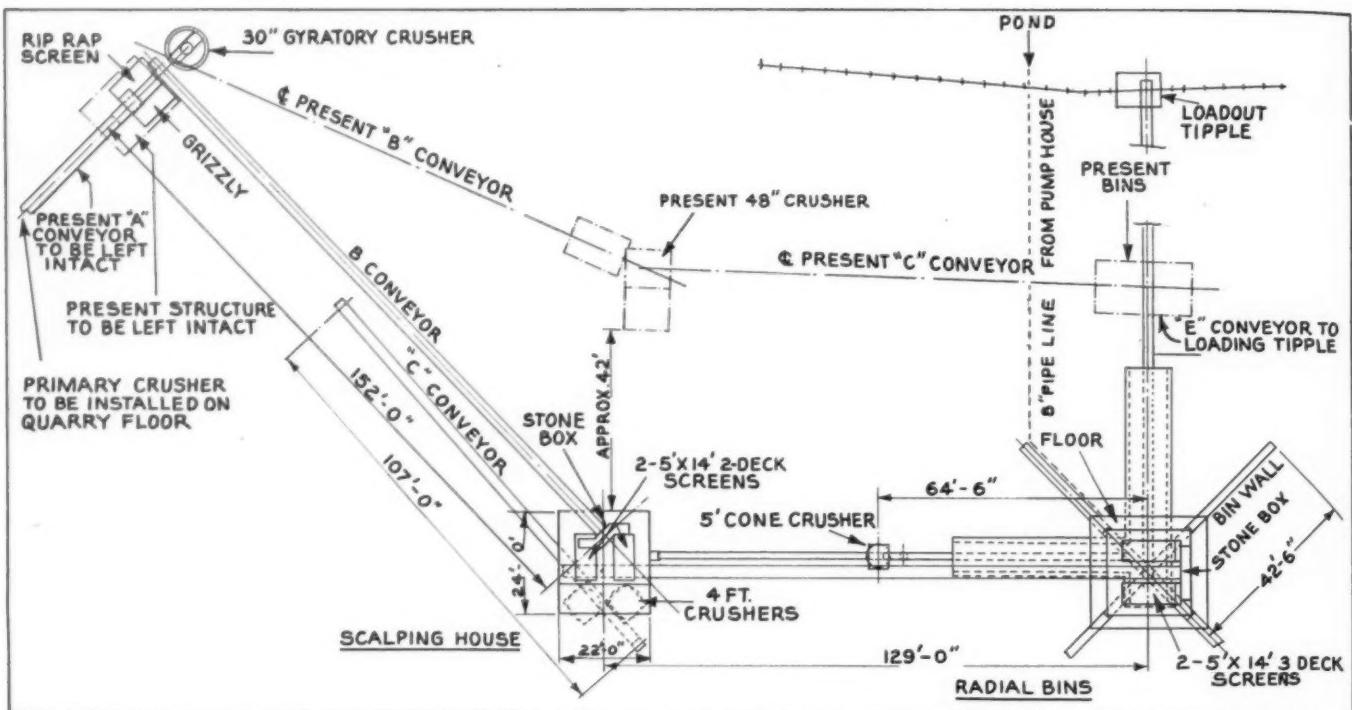
The stone handled is rather large so the Euclid truck bottoms have been reinforced with heavy 2- x 2-in. angle iron inverted so the "V" is upwards. The entire bottom of the truck bed is covered with these welded-in-place angles.

Loaded trucks move up a ramp (about a 500 ft. haul) to the primary crusher where they circle the crusher building and then back in a short distance and dump. The upper rim of the primary crusher is protected by old crusher jaw plates so that the impact of dumping is partially absorbed by these old liners. Smooth jaws are used on the crusher and Superintendent Rogers has little to say in favor of corrugated jaws. "Smooth jaws are the only ones to use when you want to



Quarry haulage unit dumping to hopper feeding primary crusher

CRUSHING



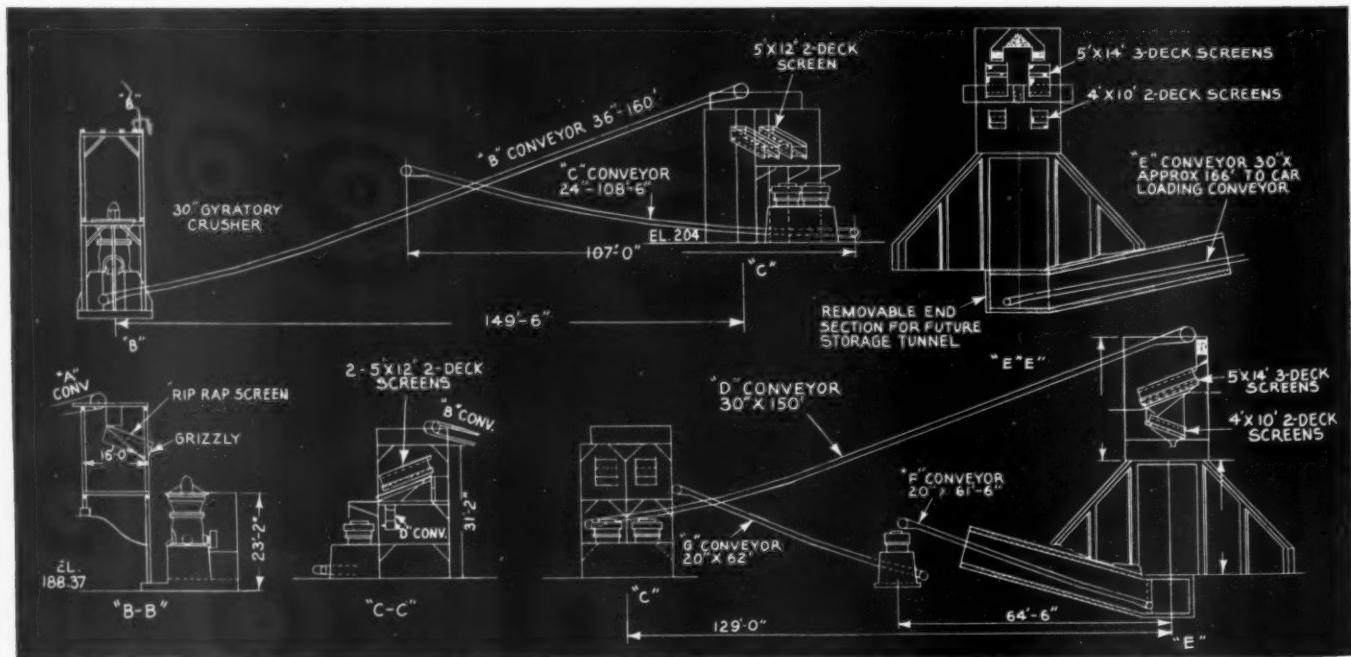
Plan of modernized crushed stone plant, showing relocation of primary crusher on quarry floor

crush stone," he said. For dislodging any large stone in the crusher, a steel superstructure has been erected over the primary from which hooks, wedges, etc., can be operated through an electric 2-drum hoist. All the small items such as wedges, etc., used for dislodging stone are provided with heavy steel rope slings all firmly "U" clamped to the members; no chains are used as these can break under strain and would fall into the crushing section.

The primary crusher is set to deliver a 10-in. product that passes to

an inclined, 42-in. Robins belt conveyor. This conveyor as well as No. 4 conveyor (later described) is driven through a Link-Belt speed reducer. The stone is conveyed to a stone box that changes the direction of fall of the stone 90-deg. From the stone box the rock falls onto a stationary scalper-grizzly. This is a perforated manganese steel plate (3-in. openings, round) about $\frac{3}{4}$ -in. thick. It is 4 ft. wide and 12 ft. long. Oversize falls to the 30-in. Allis-Chalmers gyratory crusher which acts as the secondary reduction unit. The undersize and the

discharge from this McCully falls to an inclined 36-in. belt conveyor that delivers to the top of a dry screening section with two 5- x 12-ft. F-600, double-deck Tyler vibrating screens. The rock flow splits and goes to the two screens operating in parallel. Oversize passes to two 4-ft. standard Symons cone crushers. The crusher discharge is returned to belt No. 2 by a 26-in. return belt. All conveyors in this section and in the balance of the plant were supplied by Continental Gin Co. If desired, oversize from the lower deck of these two screens can



Elevation details of modernized crushed stone plant

CRUSHING

be sent to the cones. The secondary crusher is set to give a 6-in. discharge and the cones 3-in. In the changes that are now in progress a large surge pile with suitable reclaiming facilities will be provided after the two cone crushers.

At the time of inspection the top deck of one of these screens had 2½-in. wire mesh and the lower deck of both screens had 1½-in. wire. Throughs from both decks joined and passed to a 30-in. inclined conveyor belt serving the final screening and washing section. The top deck of the other screen had 2½-in. round perforated steel plate. Motors driving the various belt conveyors are protected by steel housing that is designed to permit cooler air to enter at the bottom with louvers at the top for the heated air to escape.

The final screening and washing section consists of two parallel sets of two vibrating screens each, with one screen mounted above the other and back-to-back. The stone is split to the two sections operating in parallel. At time of inspection only one set of screens was in use and was handling the load very nicely.

The top screen in each parallel section is a 3-deck, 5- x 14-ft. W. S. Tyler Co. No. F-800 screen. The decks had 1¼-in., ¾-in., and ½-in. wire mesh, respectively. Water to this set of screens was through five headers of 6 nozzles each with each nozzle being a ¼-in. pipe slightly flattened. The pressure gave a large volume of water to the unit. The double-deck lower screen is 4- x 10-ft., Tyler F-300 with ½-in. and ¼-in. cloth. This screen is equipped with 19 nozzles operated through four headers. Two screens used practically all the output of an 8-in. 1750 g.p.m., 200 ft. head centrifugal pump that secured its supply of water from an impounded creek near the plant. The fines through the lower decks are flumed to a settling pond where they are recoverable by a tractor and dozer and a clam-shell rig. The wash water is ponded and recirculated after settling. The stone falls to four ground storage bins below.

Storage and Loading Out

Four compartments which make up the centrally located storage system normally provide for storage of 2½-in., 1¼-in., ¾-in. and ½-in. crushed stone. The four sizes can be blended on the loading belt to meet any of the 13 state specifications. Storage capacity here is small but business conditions have resulted in practically no accumulations. Excess stone can be cast back by any of the clam shell rigs. When desired, the larger sizes of stone in these piles can be sent to a 3-ft. standard Symons cone crusher and a 48-in. Telsmith gyraspHERE for recrushing. The stone going to these crushers is received on a 20-in. inclined belt conveyor, and the crushed



Oversize in the ground storage quadrants can be recrushed in this 3-ft. short head cone crusher, and the throughs returned to the screening section

material likewise passes to a second 20-in. belt conveyor. The latter belt returns the rock to belt No. 4 serving the main screening section.

Stone for car loading is drawn to a 30-in. belt and delivered to a 4- x 8-ft. Ripl-Flo 2-deck Allis-Chalmers screen where the material is given a final rinse. The top deck takes the heavier load. Stone can be diverted past this screen and loaded direct to the cars below over a stone ladder. This reclaiming belt for car-loading is loaded through four quadrant gates that face each other over the belt with a long lever control system on the gates. The gates are controlled from the loading tipple over the railroad tracks. Water draining to the reclaiming tunnel from the washed aggregate above is removed by a small sump pump.

At the loading point is a permanent batch sampler so that material going to the cars can be sampled. Alongside the track there is also a small testing laboratory. The sampler is mounted on a long swinging arm and can go under the stream of rock flowing to the cars. The shallow tilting pan on this arm is then returned to a small steel hopper near the landing where the sample is dumped into a steel cone serving the laboratory pan or bucket. When cars are being loaded, a man is kept in the car to throw out any foreign material that might inadvertently have gotten into the system, thus assuring that an acceptable product is shipped.

Cars for loading pass under the chute by gravity but if it is desired to push any car upgrade a loaded Euclid from the quarry pushes the car up hill under the loading assembly. Such a truck handles two empties if necessary. For truck loading two clam shell rigs are available. One of the rigs is provided with an Owens bucket.

Safety plays an important role at this plant. Mr. Watkins was formerly

superintendent, but due to recent hospitalization, has taken over the safety program of the Bryan Rock and Sand Co. He finds it a full time job and at this writing has not had any accidents in over six months. All employees are required to wear shatter-proof glasses, and, if any dust conditions are present, to wear a suitable respirator. Men barring down rock on the quarry face wear a harness and ropes held by other labor, (two men to a rope) keep the man safe on the face of the quarry.

West Virginia Agstone Supply

A SUMMARY of Bulletin No. 329 issued by the West Virginia Agricultural Experiment Station entitled "Lime Supplies in West Virginia," reports: estimates indicate that at least 1,600,000 acres of cropland and 2,250,000 acres of pastureland in the state are still worthy of lime treatment. To preserve this acreage for a successful agriculture in the future calls for an estimated initial application of 8,000,000 tons of ground limestone or its equivalent costing \$33,000,000. In addition, an application of the equivalent of around 600,000 tons annually is needed to maintain the lime content of the state's soils against current depletion.

In the seven-year period (1929-1935) a total of around 175,000 tons of ground limestone or equivalent was used, the bulletin states. In the nine-year period (1936-1944) a total of more than 3,100,000 tons was used, with increasing interest being shown in liming pasturelands. Of the total liming materials used in the state in 1943, 14.5 per cent was applied on pasturelands, as compared with 7.7 per cent in 1942.

Chemical analyses pertaining to more than a million and a half tons of ground limestone and marl used during 1940-1944 indicate that material of a fairly good quality, a considerable part of it excellent, is being used in West Virginia. Cost varied widely, ranging from \$1.50 to more than \$5.50 per ton on a farmyard delivered basis. Nearly two-thirds of the lime being used in the state is shipped from long distances, mainly from Ohio, adding nearly 250 per cent to the cost of the materials.

Most lime used in West Virginia is a byproduct, very little of it having been manufactured exclusively for agricultural purposes. A very extensive limestone industry exists within the state, but little direct benefit has accrued to agriculture from the industry. There are vast quantities of high-quality limestone and marl in the 15 eastern and southeastern counties of the state with little or none in the remaining counties. Trucking lime to farms in 1944 cost around \$1.53 per ton; freight cost around \$2.19 per ton.

Stockpiling

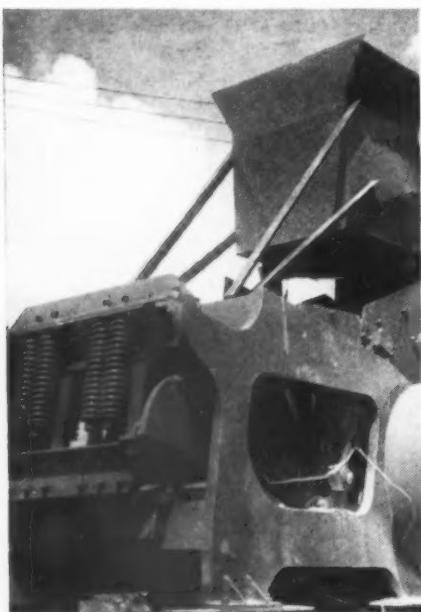
RADIAL STACKER BELTS Provide Flexible Operation

Wapak Sand & Gravel Co., Wapakoneta, Ohio, moves all material with belt conveyors. Crushes oversize with two-stage jaw crusher

By DAVID MOCINE

A 1 3/4-cu. yd. dragline with 55-ft. boom discharging bucket to surge bin over swing conveyor

STARTING PRODUCTION at its new plant, No. 2, May 10 of this year, Wapak Sand & Gravel Co., Wapakoneta, Ohio, held an official opening celebration June 4. This 150 t.p.h. semi-portable sand and gravel plant is wholly dependent on belt conveyors for material handling including a swing conveyor connecting pit to plant and three radial conveyors stockpiling finished product. Opening of this new deposit was necessitated by the scarcity of large gravel in the old deposit at plant No. 1, located on the opposite side of town. Plant No. 1 is a permanent installation with reinforced concrete foundations for finished product storage bins, with a combination dragline, pit train for gravel recovery and a 6-in. Fairbanks-Morse pump, located on a barge in the center of the pit, for recovery of fines. The older plant will continue in operation.



Two-stage jaw crusher

The new plant is located on an 80 acre leased site, with all material in the deposit minus 10-in. Overburden ranges from 1- to 4-ft., and the gravel deposit extends to a depth of 30- to 40-ft. A Lima 604 dragline with a 55-ft. boom removes overburden as well as excavates sand and gravel. The dragline, using a 1 3/4-cu. yd. Hendricks bucket, is powered by a 200 hp. Cummins Diesel engine. Material is dumped from the dragline to a 10-cu. yd. surge hopper which discharges to a 30-in. belt swing conveyor on 99 ft. centers by means of a 24-in. pan feeder. A 5 hp. motor drives the feeder and a 10 hp. motor powers the conveyor. Plant layout was designed by J. E. "Jim" Wheeler, plant superintendent at both plants; with working drawings and installation of all conveyors being made by Barber-Greene.

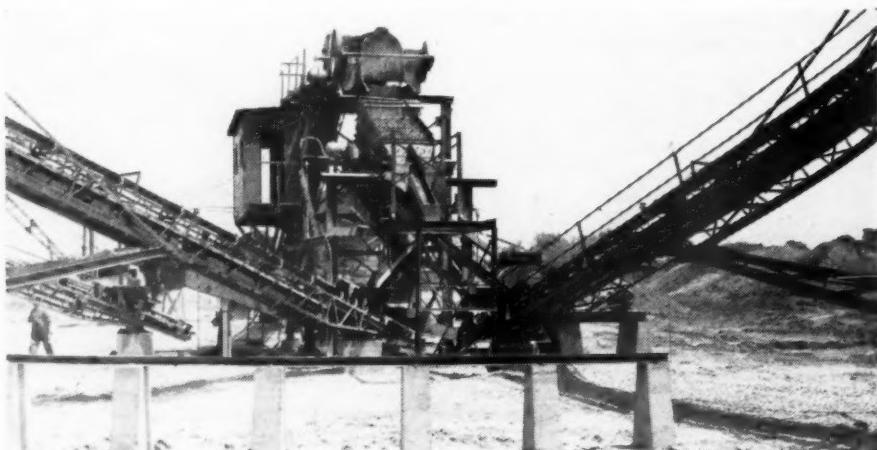
Move All Material by Belts from Pit to Stockpiles

A completely erected section of belt conveyor, 99 ft. centers, is on hand to extend the swing conveyor when this becomes necessary due to further excavation of the pit. Two additional main conveyors in the plant are on

99 ft. centers; and "Although it is not necessary to make swing conveyor additions in 99 ft. increments, it is a convenient length," according to Mr. Wheeler. All Hamilton rubber belting on conveyors was supplied by Barber-Greene.

Unusual Crushing Set-Up

Material from the pit is moved up the inclined swing conveyor and discharged to the primary crusher station, which consists of a Barber-Greene Ebersol 2-stage, 9- x 40-in. jaw crusher, integrally built with a 2-deck elliptical action 3- x 6-ft. scalping screen. Both jaws of this crusher are moving parts: with one jaw describing a vertical movement, the other an elliptical action. This last imparts action to the screen. Screen cloth on the scalping screen is 2-in. on the top deck and 1 1/4-in. on the bottom deck; with oversize from both decks being chuted to the crusher. Top opening of the crusher is set for 1 1/2-in. and the bottom opening is set for 1 1/4-in., with power supplied to the unit from a 75 hp. motor through a V-belt drive. Discharge from the crusher, plus throughs from the bottom deck of the scalping screen, are



Two radial stacker belts with rotary scrubber, above, feeding four-deck screen

STOCKPILING



Over-all view of plant showing interesting arrangement of radial stacker belt conveyors which may be moved over rail mounted on concrete piers. Dragline, surge hopper, and swinging field conveyor may be seen to the right with conveyor discharging to scalping screen operated integrally with two-stage jaw crusher. Scrubbing and screening unit, center, with roll crusher for oversize, below, and return belt to screen over bin or main belt

chuted to a common 24-in. belt on 99 ft. centers for elevation to the top of the plant, where the minus 1 1/4-in. material is discharged to a Telsmith 4 x 10-ft. rotary scrubber.

Screening and Classifying

Material from the scrubber falls to a 4- x 10-ft. four-deck Simplicity vibrating screen, with 1 1/2-, 3/4-, 7/16-, and 3/16-in. screen cloth on the four decks. Water is added at the scrubber and a series of spray nozzles located at the top of the screen provide additional wash water at this point.

Oversize on the top deck, plus 1 1/2-in., goes to a 30- x 18-in. Pioneer roll crusher set for 3/4-in. opening. The crusher, driven by a 40 hp. motor, is located at ground level below the four-deck screen. Discharge from the secondary crusher is returned by an 18-in. belt on 78 ft. centers to a 3- x 6-ft. triple-deck Simplicity vibrating screen mounted over a two-compartment truck hopper alongside the belt carrying primary crusher discharge to the plant. Oversize on the top deck, having 3/8-in. mesh, falls through a chute to the main belt conveyor for return to the plant in a closed circuit. Oversize on the second and third decks, plus 1/4-in. and plus 8 mesh, respectively, drops to separate compartments of the truck hopper. Throughs on the bottom deck, minus 8-mesh, is piped to waste.

Oversize on the second deck of the four-deck screen in the main plant,

minus 1 1/2-, plus 3/4-in., goes to one of three radial stacker belts stockpiling finished material in an arc around the plant. All three belts, two stockpiling gravel and one sand, are 18-in. belts on 78 ft. centers; and all travel in 40-ft. radius. The two gravel belts operate at 250 f.p.m. and the sand belt operates at 350 f.p.m. Radial track length varies on the three stacker belts, with large gravel stockpiled from a radial track 75-ft. in length; small gravel from a belt mounted on a radial track 60-ft. long; and the track supporting the sand stockpiling belt is 79-ft. long.

Oversize on the third deck of the four-deck plant screen, minus 3/4-, plus 7/16-in., goes to the middle stacker belt for stockpiling. Oversize on the bottom deck, minus 7/16-, plus 3/16-in., is chuted to the transfer belt receiving secondary crusher discharge at a point bypassing the secondary roll crusher. Throughs from the bottom deck, minus 3/16-in., fall to a 22-in. Eagle screw sand classifier, 22 ft. long. Dewatered sand is discharged from the screw to the third or sand stacker belt. Excess fines and clay overflowing from the sand classifier are piped to waste. Wash water is supplied to the plant by two Weinman pumps, rated at 700 g.p.m. each, and individually powered by 20 hp. motors.

Material is reclaimed from the stockpiles by two gasoline-engine driven Barber-Greene loaders, both with a capacity of 3-cu. yd. per min.:

one rubber mounted and the other crawler tread mounted.

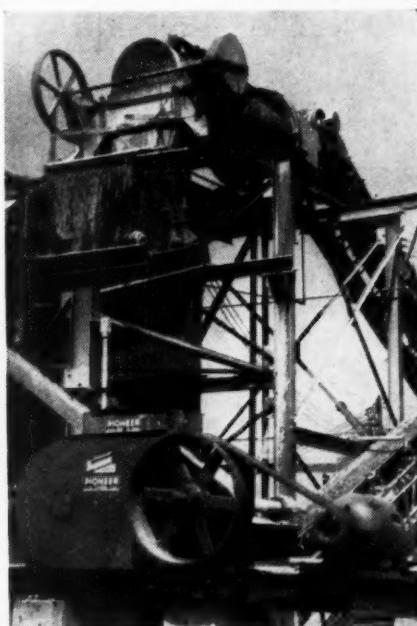
The principal market for this plant's sand and gravel is in Lima,



J. E. Wheeler, superintendent of both plants

Ohio, 16 miles distant. A small percentage of plant output is hauled in company trucks, with the remainder called for in private and county trucks at the plant property. Demand is

(Continued on page 94)



Secondary roll crusher, below, with rotary scrubber, above, and four-deck vibrating screen, center, left



Sand screw classifier and dewaterer discharging to stacker belt

Lime

Variations In PLANT DESIGN

HERE are no two lime plants anywhere near alike. In all there are variations of arrangement, some for the better and some for the worse. Variations are found in stone storage systems, stone charging systems, in kiln and kiln firing systems, and in lime discharge and handling systems. All of these systems cannot be described and illustrated in detail in this article, but the simple drawings, Figs. 1 to 5, show many interesting applications of stone storage and supply, charging, kiln design, fuel systems, and lime discharge.

Stone Storage and Supply

Fig. 1 presents the various systems of stone storage and supply. At times storage piles are resorted to, particularly if stone is delivered by boat. Such stone is usually handled (1) by shovels to truck to be delivered at the kiln. Or (2) there may be live storage with the kiln charging car shuttling

By VICTOR J. AZBE*

Interesting applications of stone storage and supply, kiln charging and design, fuel systems, and lime discharge methods

underneath. There may be (3) stone bunkers filled by truck or conveyor located at the base of the kiln incline. When there is an adjacent hillside (4), stone bunkers may be located above, discharging directly into the kilns without any intervening conveying. Storage can also be obtained by having a series of quarry cars filled during the day for use at night (5). If stone is delivered by rail from some distant point the system shown at (6)

is the most satisfactory. Storage for up to 20 hours may also be incorporated into the kiln (7). Truck delivery (8) to kiln car and (9) a tramway system with bins on kiln top level with a charging car shuttling back and forth are further methods.

Stone Charging

In Fig. 2 the stone charging systems are shown. When there are just one or two kilns, a skip (3) may be the best and cheapest. If there are more kilns, then the system shown at (1) would be preferable. This could be made almost entirely automatic requiring only one man located either at the hoist, bin, or kiln top. Sometimes the rocker dump car is used, but that requires manual dumping. The side dump and gable bottom cars can be made automatic. The other systems shown are all used but usually only because local conditions make them desirable.

Kiln Systems

The kiln system series is featured in Fig. 3. The lateral and parallel, charging and drawing refers to the directions in which the center burner is installed with respect to these operations. It is an important consideration in the general flow sheet but not to the reader for the moment.

At (9) the various kiln shell sizes are shown and their respective lime producing capacities. Even a 9 ft. diameter kiln properly arranged is capable of a 30-ton output. Such a kiln of the old direct hand-fired type would have produced only about 8 tons of lime per day.

At (10) is presented the stone size series. Stone may be 4- to 8-in., 3- to 6-in., 2- to 4-in., and 1- to 2-in. All of these can be burned in vertical kilns but each of these will require a somewhat different kiln. The 1- to 2-in., or even 2- to 4-in. could not possibly be calcined in the kiln intended for 4- to 8-in. stone.

For the largest stone the highest kiln is required, reducing progressively as stone size decreases. With large stone only a single center burner with two rows of ports is used, with smaller stone there is a progressive elaboration until with the smallest there are three center burner systems and eight rows of ports, to assure that every portion of the bed receives the required amount of heat.

Small stone kilns have other special features such as division of the hot zone into many almost entirely sep-

*Azbe Corporation, St. Louis, Mo.

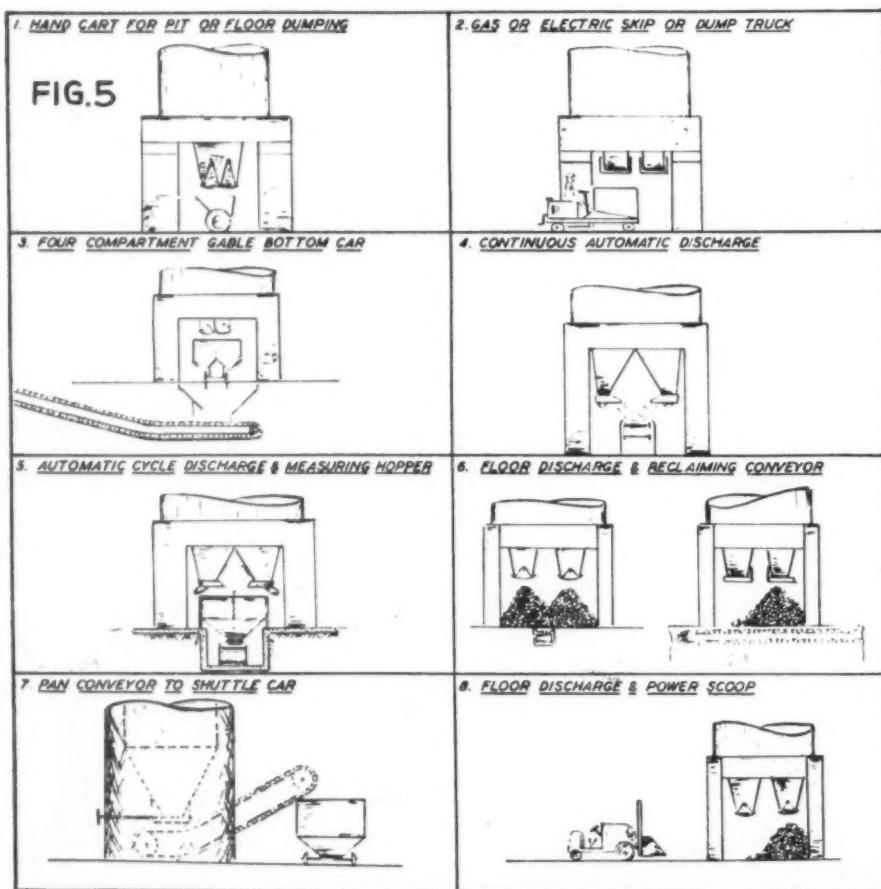
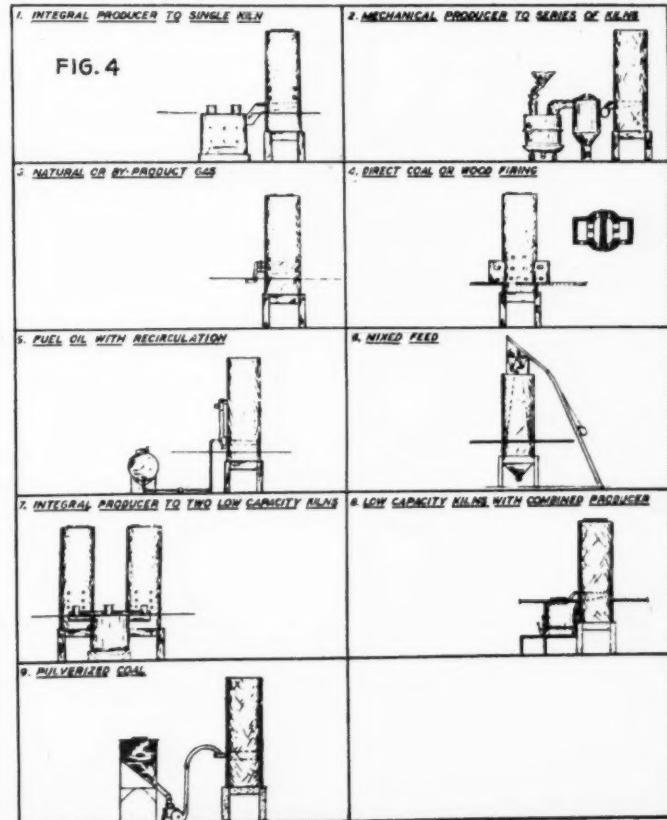
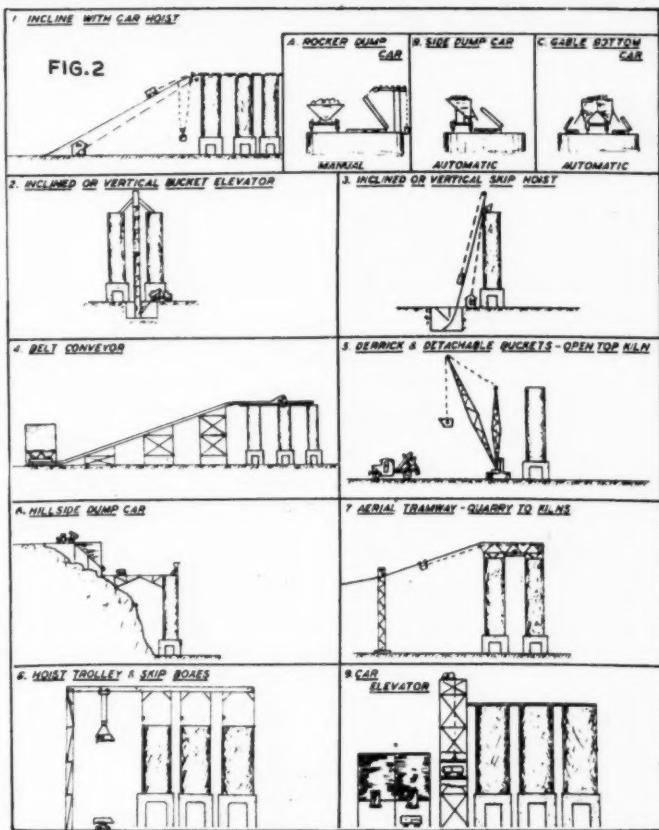
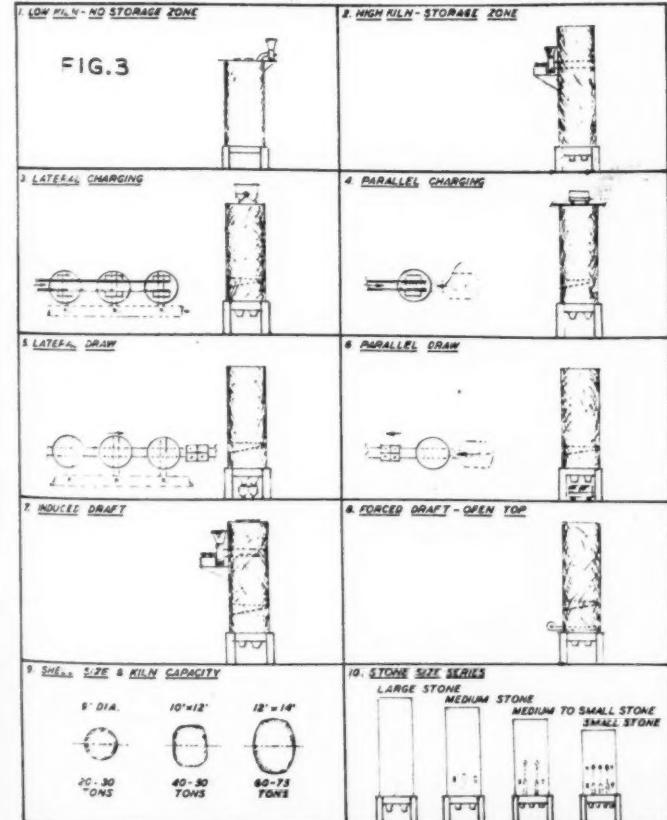
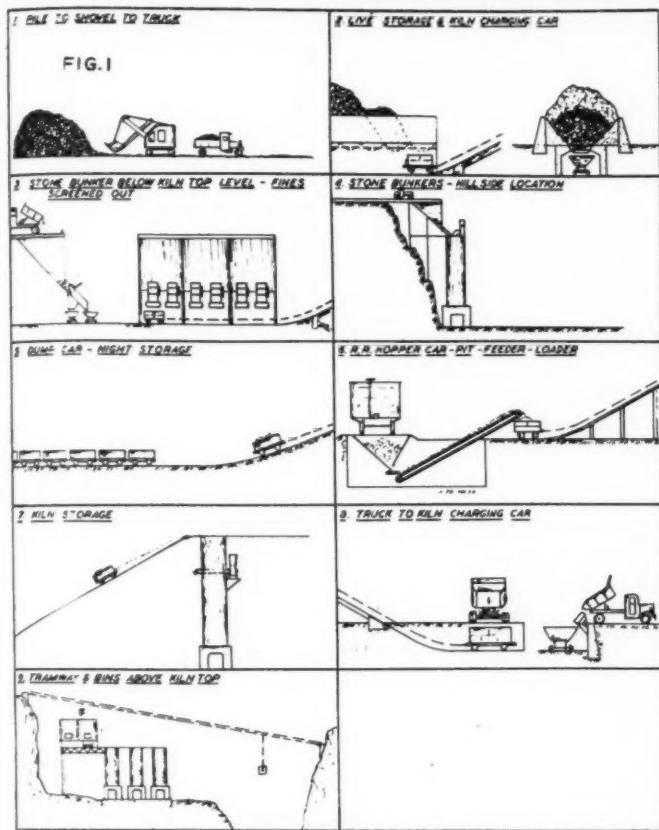


Fig. 5: Lime discharge systems for vertical kilns

LIME OPERATING PRACTICES QUARRY TO KILNS



BLASTING DEMONSTRATION

Missouri crushed stone producers and explosives officials witness latest technique in blasting procedure

MISSOURI limestone producers and explosive powder manufacturers' representatives met May 25 at the Hall and Riley quarry, Cooper county, Missouri, to learn more about improved methods of using dynamite. All phases of blasting were demonstrated and discussed including: hole location, drilling, loading, and shooting.

Several explosive technicians participated in the meeting and answered questions asked by the 50 men in attendance. Powder company representatives present were: Paul P. Eagan, Hercules Powder Co.; F. T. Newcomb and Paul D. Mayfield, Kansas City, Atlas Powder Co.; A. G. Muller and T. F. Dungan, Joplin, E. I. Du pont de Nemours and Co.; Jules Beineke and A. W. Baker, St. Louis, Illinois Powder Manufacturing Co.

Paul Eagan of Hercules Powder Co. was officially in charge of the demonstration but stated at the start of the meeting that Hall and Riley's powder man, Joe Piatt, had done a good job of engineering the location, drilling and loading of holes. Eagan placed his stamp of approval on Joe Piatt's judgment and ability. Mr. Piatt has had many years of experience in shooting Burlington limestone, a

tough, high quality stone common to parts of Missouri.

Blasting Demonstration

The principal problem involved in the demonstration was straightening an irregular 24-ft. face that was wide at the toe. Three rows of holes were drilled 4½ ft. apart. Holes were 9 ft. apart in the rows. The front row of holes was tilted outward at the bottom to take care of the stone in the wide toe. The middle row of holes was tilted outward just half as much as the front row and the back row of holes was drilled vertically. Each row of holes was about 63 ft. in length.

Mr. Eagan pointed out that dynamite had more work to do at lower levels and the work requirement diminished gradually toward the top surface of the face. Hence, the lower fourth of each hole was loaded with 60 per cent dynamite, the second fourth from the bottom was loaded with a stick for stick mix of 40 and 60 per cent dynamite making an average of 50 per cent concentration in each hole at this level. The third fourth of each hole from the bottom was loaded with a mix equal to about 35 per cent and the upper fourth averaged about 30 per cent dynamite.

Each hole down a row was loaded alike.

Delayed Action Caps

An important feature of the meeting was the selection of electric caps for each of the three rows. Short period electric caps were used. The front row of holes was capped with instantaneous caps. The middle row was capped to detonate one 40,000th of a second later than the front row and the third row was capped to detonate one 40,000th of a second later than the middle row.

It was stated by A. G. Muller of Du pont that the spread of time between detonations was infinitesimal but was sufficient to allow space for movement of rock in front of explosives in the second and third rows. Other powder specialists present generally agreed that delayed action electric caps probably were the greatest single improvement in the use of powder since the beginning of the industry.

Little Secondary Blasting

After the blast the group inspected breakage and agreed that very little secondary shooting would be necessary for all of the material to pass into the Hall and Riley 15- x 36-in. primary jaw crusher. The few oversized rock were blown from the exposed end of the 63-ft. shot and represented less than a half of one per cent of the total stone. In summarizing the demonstration it was determined that the efficiency of the shot was about 2.6 tons of shot rock per pound of dynamite.



Photos by Walker, Missouri Div. of Resources and Development
Showing irregular 24-ft. face, wide at the bottom and narrow at top, before the blast was shot. It was necessary to hold wagon drill securely in position while drilling the front row of holes due to excessive slope of the surface.

Agricultural Limestone Institute Supercedes N.C.S.A. Division

AGRICULTURAL LIMESTONE INSTITUTE will be the new name of the Agricultural Limestone Division, National Crushed Stone Association, according to action of the Board of Directors of the Division and, subject to approval of the Board of Directors, N.C.S.A., at its meeting, July 8, 1948, at Hot Springs, Va. The Institute will further be identified according to the language, "The Agricultural Limestone Institute shall be affiliated with the National Crushed Stone Association as a division thereof," as set forth in changes incorporated into the by-laws.

The Board of the Division met at the Edgewater Beach hotel in Chicago, June 4 to consider revision of the by-laws and other business affairs, with particular emphasis on promotional and merchandising plans and budgetary matters attendant thereto. Other than numerous editorial changes to the by-laws made necessary to conform with the change in name, the only other changes were insertion of a sentence requiring that applications for membership be endorsed by two active members prior to submission to the executive committee for action and substitution of the titles, "president," "vice-president," etc., for "chairman," "vice-chairman," etc., in designating the officers.

The Institute will hold its annual meeting in Chicago in 1949, independ-

ent of the parent organization. There will be a meeting of the board of directors Sunday, February 20, 1949, at 2:30 p.m., to be followed by a two-day meeting, with a buffet dinner to be served the evening of February 21. By unanimous vote, it was decided that the 1949 midsummer board meeting will be held June 10 in Washington, D. C., likely at the Mayflower hotel.

Secretary-Treasurer's Report

In his report, secretary-treasurer J. R. BOYD, outlined the financial condition of the Division. Disbursements thus far in 1948 almost exactly equal income, which suggests that a greater margin may be necessary to provide a surplus in order that an ambitious program of activities may be continued and expanded.

Managing Director's Report

Managing director HENRY HUSCHKE summarized the activities of his office to date in 1948. His office has sent to the membership an unusually great number of informative letters, mainly pertaining to legislation concerned with agriculture and soil conservation appropriations. These letters were briefly summarized in review. The Division had been very active throughout consideration of the various bills considered in the establishment of funds for the Agricultural

Conservation Program, in stimulating members to get farmers in communication with Congressmen and Senators in support of an adequate appropriation. Chairman H. C. Krause personally appeared before the Senate Subcommittee on Agricultural Appropriations.

A bill, S.2318, introduced by the Senate Committee on Agriculture and Forestry, on March 15, to provide for a coordinated agricultural program has been re-written and is now before the Senate. The Division participated by filing a statement in connection with the bill and the re-written bill is believed now to be acceptable to the industry. Also, the Division has filed a statement in opposition to provisions of the Hope Long-Range Conservation Bill that would limit to 25 per cent the payment for the cost of liming and similar practices on the part of the Federal government. Mr. Huschke has made numerous contacts with members of Congress and officials of the Department of Agriculture in the interests of an adequate federal program for liming and related practices.

Preliminary work has been completed on a manual for salesmen and truckers and a dummy was presented for approval of the Board. A new invisible ink postcard has been prepared as a promotional piece and orders by member companies have been very heavy, indicating wide acceptance. Six copies of the film "The Other Side of the Fence," produced by the Phillips Petroleum Co. have been purchased for use by members for use in promotion of soil conservation practices. Copies will be made available at a rental of \$10 per week.

(Continued on page 87)



Showing results of blast in straightening the face both horizontally and vertically. Less than one-half of one per cent of rock brought down needed secondary shooting

Conveying



Panoramic view of new sand and gravel plant before stockpiles were built up. At far left is the pit and loading facilities. The two prominent conveyors in the left foreground are for gravel and grit storage over reclaiming tunnel. Near the center is the screening plant and hydroseparator.

Million Dollar Sand and Gravel Plant Uses Belts From Pit to Dock

MARKING its first entry into the sand and gravel business, the New York Trap Rock Corporation, one of the nation's largest crushed stone producers, has just completed a new and modern sand and gravel plant near Port Washington, on Long Island in New York state. The plant is a few miles east of Port Washington on Hemstead Bay.

About a year and a half ago this company purchased the deposit from O'Brien Brothers Sand and Gravel Co. There was no plant at the pit as the former operators trucked the sand and gravel for processing to a plant some two miles away. Early in 1947 the New York Trap Rock Corporation contracted with Merritt, Chapman and Scott Co., New York, N. Y., to erect an all-steel and concrete processing plant the cost of which ran close to the \$1,000,000 figure.

Like most deposits in the area, it is of glacial origin with sand predominating. There is a very small amount of gravel in the plus 4-in. range and so little in the plus 7-in. range that the plus 7-in. size is rejected, there not be-

By W. B. LENHART

New York Trap Rock Corporation constructs modern steel and concrete sand and gravel plant with all movement of material from pit to plant and from stockpiles to barge by belt conveyors

ing enough to warrant equipment to process it. As a result only one size of gravel at the time of inspection was being prepared, and this is plus $\frac{1}{4}$ -in., minus 1 $\frac{1}{4}$ -in. which is a mixture of crushed and uncrushed gravel. The deposit is producing about 17 to 18 per cent of this material with the balance in "grits" and sand, the latter being all minus $\frac{1}{8}$ -in. material. No great amount of stripping is necessary; the deposit has about 12-in. of top soil and vegetation. The face of the bank is about 135 ft. high, and when necessary will be caved down by means of a crane and a drag mounted on the rim of the deposit.

A movable hopper and field conveyors are used to deliver the pit run to the plant. The plus 7-in. is rejected at the field hopper over a grizzly. There are three of these pit conveyors, 100 ft. long, each with 42-in. belts. At

Reclaiming tunnel conveyor transfers to a hopper feeding a 36-in. belt conveyor which discharges to a cross belt or shuttle conveyor that loads scows moored to each side of dock

present the field conveyors follow the contour of the old pit and, as the face recedes it is planned to interject fixed flights of conveyors to bring the unprocessed material to the plant. The field conveyors are moved by the all-electric 120-B Bucyrus shovel that does the excavating and loading at the face. The 15-cu. yd. pit hopper feeds the first belt through a pan feeder. Excavating and plant delivery practice here follows quite similarly that of many of the sand and rock producers in southern California.

Scrubbers Eliminate Soft Particles

As the deposit has some soft particles in it, the plant is designed to remove very efficiently all this material with three Telsmith super-scrubbers. This is ample capacity for the relatively small tonnage of plus materials that need disintegrating, bearing in mind that the amount of plus $\frac{1}{4}$ -in. material going to these scrubbers is only about 17 per cent of the plant's capacity which is now 750 cu. yd. per hour, but which can be raised to 1000 cu. yd. per hour.

All material now being processed is washed but the original design of the plant provides for the installation of a dry sand section between conveyor belts Nos. 3 and 4. This accounts for the two conveyor belts in series delivering from the scalping and crushing section to the washing plant instead of having one long belt. The dry sand section will provide for storage over the reclaiming tunnel at the end nearer the pit. All shipments are by the company's fleet of deck scows, but provision may be later made for truck deliveries.

The plant, which was designed cooperatively by engineers of the New





Sand is stored with the radial stacker on concrete structure, to the right. At extreme right is the loading conveyor on the water front

York Trap Rock Corporation and the Smith Engineering Works, uses belt conveyors throughout. Three sizes of material—gravel, grits and sand—are being produced: minus 1 1/4-in., plus 1/4-in.; minus 1/4-in., plus 1/8-in.; and minus 1/8-in. Vibrating screens are used throughout. Salt water, pumped by a 12-in. centrifugal pump mounted on the loading dock, is used for washing. Use of sea water for washing sand and gravel is common and accepted practice in New York. Water is pumped to the plant, a distance of about 1000 ft. through a 14-in. Universal Type "T" cast iron pipe in 6-ft. lengths.

Sand Recovery

A feature of timely interest is the use of a 50-ft. diameter Dorr hydro-

separator which is the first de-watering step in processing the minus 1/8-in. sand and, at the same time, eliminates much of the clay particles in the hydroseparators overflow. It is one of the largest diameter separators used in the industry (to this writer's knowledge) and the large settling area makes it possible to retain the desired amount of the finer sizes of sand. In such a device, speed of rakes, inflow turbulence, rate of underflow discharge, dilution, velocity and volume of bulk intake are all controllable, and give the operator a wide variety of adjustments in obtaining just the product desired. The pulp, prior to reaching the hydroseparators, passes over a battery of six "grit" screens, and the minus 1/4-in., plus 1/8-in. material is removed. This is sent to the

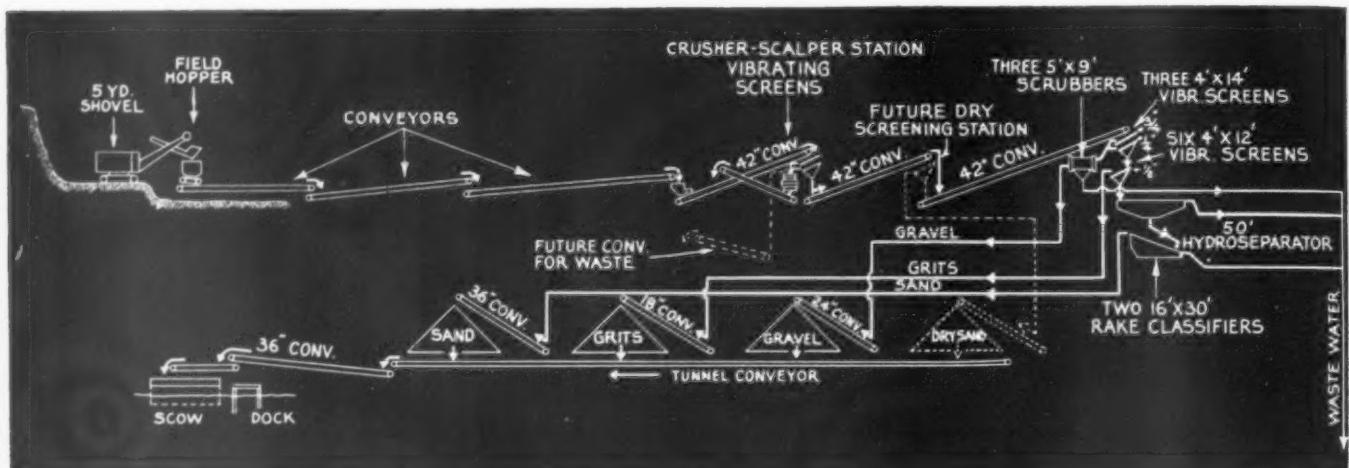
stockpiles on a separate conveyor belt. Finer sand and the grits can then be later blended on the main loading belt to make concrete sand of most any specification. Removal of the larger sized grits from the hydroseparators also throws less strain on the rake mechanism. The hydro-separator is mounted on a massive concrete structure well above ground level.

Underflow from the hydroseparators splits and goes to two 16- x 32-ft. Dorr rake-type dewaterers (classifiers), each dewaterer having four sets of rakes, each 4-ft. wide. Here again controllable features in the device are such that fines can be retained or rejected to meet almost any sand specification. The overflow from these two devices containing any remaining clay, and

Over-all view of sand and gravel plant showing three moveable 42-in. belt conveyor sections from deposit to hopper feeding conveyor belt inclining up to crusher-scalper station. Two conveyor belt sections incline up to scrubber-screening station with 50-ft. hydroseparators and two rake classifiers below, three stacking belts radiating from scrubber-screening station and a reclaiming tunnel conveyor for blending which feeds a 36-in. conveyor belt extending to docks where a shuttle conveyor loads scows



CONVEYING



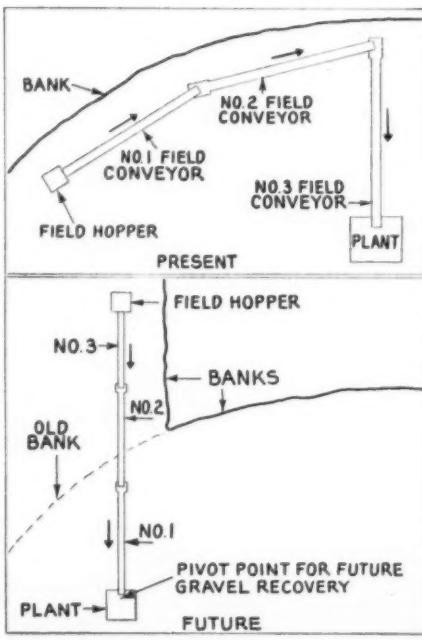
Showing flexible arrangement of conveyors for material handling and stockpiling

the overflow from the large diameter hydroseparator are rejected and are flumed to a settling basin. The clear water is overflowed from this basin and is returned by gravity to the bay through a 24-in. corrugated steel pipe.

Sand from the Dorr rakes is elevated via a belt conveyor to a novel sand stacking arrangement. This consists of a 36-in. conveyor belt mounted on concrete pillars in such a manner that the conveyor can swing radially in a 300-deg. arc. This boom-like conveyor then builds up a large sand stockpile. The belt is 43 ft. long, and its discharge point is about 50 ft. above the reclaiming belt, making possible a stockpile of 10,000 cu. yd. total capacity results.

The reclaiming tunnel under the stockpiles is about 500 ft. long and is of massive concrete construction. Considerable excavating was required to get this structure below ground level. In this section is a 36-in. belt conveyor, 490 ft. centers, which is fed by 19 gravity type gates, each 15- x 24-in.

The 36 in. belt conveyor, 490 ft.

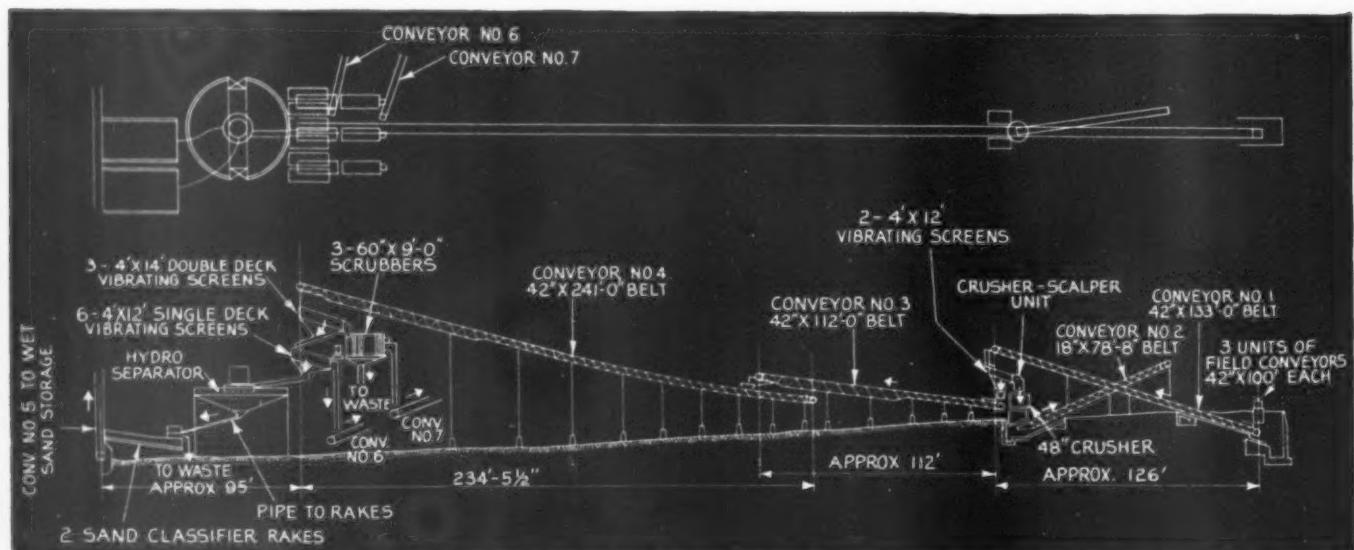


Present and future conveyor layout

centers, discharges onto a 36 in. belt conveyor, 682 ft. centers, which passes under the road and goes out to the loading dock where it discharges onto a 42 in. x 39 ft. reversible shuttle type barge loading conveyor, installed at right angles to the dock conveyor. Further details as to conveyors are in the appended tabulation. All the conveyors were made by Barber-Greene for Smith Engineering Works. The larger belt drive assemblies use Falk speed reducers.

Construction Features

Some details of the construction features follow: The field conveyor system delivers to a hopper at the plant which hopper, in turn, serves the No. 1 conveyor belt. This delivers to two, 4- x 12-ft. double-deck Telsmith scalper screens, having 3-in., and 1½-in. wire mesh, respectively, operating in parallel. The purpose of the top deck is to take some of the load off the lower and finer screen as all the oversize from these two decks fall to the



Elevation and plan details of new sand and gravel plant showing extensive washing and classifying facilities

CONVEYING

48-in. Telsmith Gyrasphere crusher, the only crusher in the plant. The crusher discharges to conveyor belt No. 2 which returns the material to belt No. 1 for rescreening.

The fines from the scalper screen fall to belt No. 3 which in turn serves belt No. 4; the split here, as previously mentioned, permits a dry cut of sand to be taken out later if desired. No. 4 is a long, inclined belt and its load is split to three 4- x 14-ft., Telsmith two-deck wet screens. The top decks are $\frac{3}{4}$ -in. and the bottom $\frac{1}{4}$ -in. mesh. Here again the top wire mesh serves only to take the load off the lower and finer screen as all oversize from both screens join and go into the three super-scrubbers. As material discharges from conveyor No. 4 at the top of the sizing building, a heavy flow of water is added, and additional water is used on subsequent screens as well as in the scrubbers. The scrubbers are 60-in. in diameter and 9 ft. long and are provided with liners and lifter baffles that can be replaced when worn. On the outboard end is a 2-ft. section of slotted (3/16-in.) perforated metal. The scrubber works on the counter-flow principle; that is, all the pulp goes into the feed end through a suitable spout and the bulk of the liquid pulp leaves from this same end and carries with it most of the sand which may have been carried into the scrubbers with the gravel. The remainder of the larger sized material and pulp remains in the rotary scrubber and discharges out of the opposite end. The perforated end section removes any remaining fines not previously included and this material goes to the hydroseparators or to waste. The thoroughly washed gravel from which all soft particles have now been removed passes to belt No. 7 and is sent to the stockpile. As previously stated this is the only gravel produced at present.

The sand and grits passing the $\frac{1}{4}$ -in. bottom deck of the three 4- x 14-ft. double deck screens pass to a battery of six, 4- x 12-ft. single-deck Telsmith wet screens where the "grits" are prepared. The screens have $\frac{1}{8}$ -in. cloth and operate in parallel. The grits fall to belt No. 6 and go to the storage pile. The minus $\frac{1}{8}$ -in. material flows to the 50-ft. hydroseparators previously described in enough detail to give the reader the important features.

Each scrubber is driven by a 40-hp. Type AT Ideal Electric Co. motor through chain drives. All the electrical features of the plant interlock to minimize operating difficulties due to stoppage of any unit in the flow sheet.

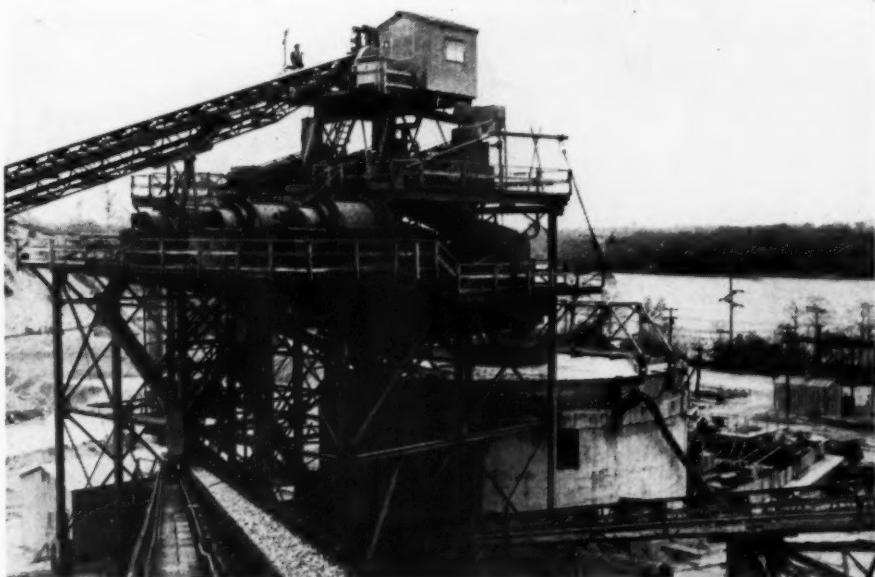
Wilson P. Foss, Jr., is chairman of the board of the New York Trap Rock Corporation and Wilson F. Foss, III, is president, succeeding Stirling Tomkins, who retired on January 1. M. C. Dow is chief engineer with offices in Newburgh, N. Y., and Tom Lynch is superintendent of the new plant. The



Close-up of moveable conveyor belt looking toward shovel loading hopper at face of deposit



Scalping screen station with gyrasphere crusher below and return belt, to the left, and belt conveyor inclining up to scrubbing-screening station, to the right



Scrubber-screening station. Note chutes from scrubber to gravel stacker conveyor, left, the stacker conveyor for grits, center foreground, and to the extreme right may be seen sand stacker conveyor belt from rake classifiers



Close-up of hydroseparator and rake classifiers



Radial 36-in. belt conveyor on track builds up stockpile of sand over reclaiming tunnel



One of the barges loaded with aggregate. Note shuttle conveyor to permit loading scows on each side of dock

construction was under the direction of L. E. Ott, project supervisor; J. W. Cheever, job superintendent, and T. C. O'Conners, office manager, all of the staff of Merritt, Chapman and Scott, the prime contractors.

Appendix

Field Conveyors 42 in. x 100 ft. No. 1, 2, 3 geared-in-head motors and roller chain drives—20 hp. each.

No. 1 Conveyor 42 in. x 133 ft., 100-hp., 900 r.p.m. motor, direct-connected to 8HC Falk reducer and roller chain drive to conveyor head shaft.

No. 2 Conveyor 18 in. x 78 ft. 6 in., $7\frac{1}{2}$ -hp., 1800 r.p.m. motor with B-G speed reducer.

No. 3 Conveyor 42 in. x 112 ft., 60-hp., 900 r.p.m. motor, direct-connected to 7 HC Falk reducer and roller chain drive to conveyor head shaft.

No. 4 Conveyor 42 in. x 241 ft., 75-hp., 900 r.p.m. motor, direct-connected to 7 HC Falk reducer and roller chain drive to conveyor head shaft.

No. 5 Conveyor (sand) 36 in. x 210 ft., 60-hp., 900 r.p.m. motor, direct-connected to 7 HC Falk reducer and roller chain drive to conveyor head shaft.

No. 6 Conveyor (grits) 18 in. x 186 ft. 6 in., 10-hp., 1800 r.p.m. motor with B-G speed reducer.

No. 7 Conveyor (gravel) 24 in. x 210 ft. 6 in., 15-hp., 1800 r.p.m. motor with B-G speed reducer.

No. 8 Conveyor (radial sand stacker) 36 in. x 43 ft., 20-hp. geared-in-head motor and roller chain drive.

No. 9 Conveyor (reclaiming tunnel) 36 in. x 490 ft., 50-hp., 900 r.p.m. motor, direct-connected to 7 HC Falk reducer and roller chain drive to conveyor head shaft.

No. 11 Conveyor (dock conveyor) 36 in. x 682 ft., 50-hp., 900 r.p.m. motor, direct-connected to 7 HC Falk reducer and roller chain drive to conveyor head shaft.

No. 12 Conveyor (barge loading shuttle) 42 in. x 39 ft. 6 in., 15-hp., 1800 r.p.m. motor with reversing control and B-G speed reducer.

2-4- x 12-ft. Telsmith double-deck scalping screens with 10-hp., 1800 r.p.m. motors and V-rope drives.

1-No. 48 Telsmith Gyrasphere crusher with 100-hp., 900 r.p.m. motor and V-rope drive.

3-4- x 14-ft. Telsmith double-deck Vibro-King screens with 10-hp., 1800 r.p.m. motors and V-rope drives.

6-4- x 12-ft. Telsmith single-deck Vibro-King screens with $7\frac{1}{2}$ -hp., 1800 r.p.m. motors and V-rope drives.

3-60-in. x 9-ft. Telsmith Super scrubbers with 40-hp., 900 r.p.m. motors and silent chain drives.

19-15- x 24-in. Telsmith bottom bin gates.

Marble Durability Tests

LABORATORY STUDIES on basic causes of marble weathering, under the direction of D. W. Kessler, National Bureau of Standards, indicate that the principal destructive force results from temperature cycles that produce a permanent growth or actual increase in volume. Growth of marble is accompanied by decreases in structural properties such as strength, coherence and elasticity. Not all marbles exhibit the same rate of growth or the same rate of deterioration. Most marbles are composed mainly of calcite crystals, which, when heated, expand along one axis and contract along another. On cooling, the reverse is true.

Produce Aggregate

WINTERS SAND AND GRAVEL CO. is in production of aggregate for concrete near Liberal, Okla. In addition the company will produce agricultural limestone.



By W. B. LENHART

View of extensive quarry operations with crushing and cut stone plants in the left background

Convert Waste Stone to Valuable By-Products

**North Carolina Granite Corporation produces
large tonnage of closely graded poultry grits
and concrete aggregates from waste cut stone**

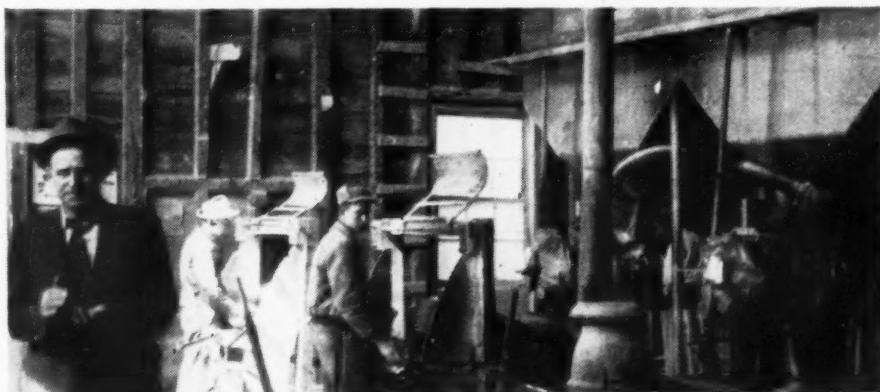
A GOOD EXAMPLE of an old company keeping up to date is the North Carolina Granite Corporation, Mt. Airy, N.C., which has been in operation for about 60 years. Originally the quarry output was all confined to dimension and cut stone, but at present nearly three-fourths of the tonnage shipped is crushed stone products, commercial aggregates, etc. However, two-thirds of the total sales value of the quarry is for cut stone. From this quarry, which covers an

area of about 80 acres, about 3000 car loads of material per year are shipped.

"The Rock" at Mt. Airy resembles a giant oyster shell from which nearly 50,000,000 cu. ft. of granite has been removed with enough in sight to easily run another 500 years. The granite is a biotite granite, medium grain, almost white, but with a gray appearance. A cubic foot of the material weighs 165 lb., and the crushing strengths are said to be 23,069

p.s.i. It absorbs about 0.33 lb. of water per cu. ft.

Massive granite is first separated as a huge sheet by special blasting technique. This sheet may be from a few feet to 10 ft. thick, and the horizontal crack made by the progressive but light blasting is a sheet-crack that sometimes covers acres in extent. Once this horizontal crack starts, it spreads at a remarkable uniform thickness. Blocks of granite are drilled with a row or rows of vertical holes, and steel wedges split the sheet up into rectangular blocks. The batholith has no seams vertically or horizontally. The size of these blocks is limited to railroad capacity, but several have been processed in the finishing plant that weighed in the neighborhood of 70 tons. One column section we saw was 4- x 4-ft. and about 40-ft. long. The larger sections go for columns, bridge piers, and decorative stone of massive dimensions. The Arlington Memorial Bridge at Washington, D. C., used some 685 carloads of this beautiful granite. Finished stone is shipped all over the United States, for memorials, buildings, bridges, and monuments. Other dimension stone products are curbing,



Packing room with sacking and sewing machines to the right. Superintendent John A. Simmons, to the left, has a sample of chicken grits in his hand

SCREENING

rubble, rip-rap, paving blocks, etc. Orders are on hand for granite curb stones to go to Chicago, New York, Philadelphia, and Washington, D. C.

Two large shops are operated for the final dressing of dimension stone as well as a separate shed where the large blocks are sawed into the proper thickness. Reciprocating saws of large dimensions make several parallel cuts at one time. The blade of the saw is of steel and No. 10 chilled bird shot is the cutting media. This is circulated over the stone and saws by suitable pumps. The rate of cutting for large blocks is roughly 7 inches per hour along one of the long dimensions of the block.

Crushing Plants Utilize Waste Cut Stone

In the production of cut stone some waste stone accumulated, and originally the crushed stone plant was intended to absorb this waste material. Recently, however, the demand for various types of crushed stone products has necessitated enlargement of the crushing plant. During March of this year, operations started with a new Pioneer 30- x 42-in. jaw crusher with a 7½ Telsmith as a secondary crusher. The jaw crusher is fed by a new 42-in. by 14-ft. apron feeder. The plant is able to turn out 100 t.p.h.

This increased tonnage demand has made it necessary to open up additional quarry areas. A feature of the new crushing plant installation is a 1000-ton surge bin silo constructed of cut stone.

Because of the close competition on road aggregates, this plant has specialized in close-graded stone sacked in 80 lb. multi-war paper bags in six sizes ranging from $\frac{1}{8}$ -in. to 1/16-in. and sold as poultry grit, terrazzo, roof gravel, grave stone, and truck sanding stone. The sparkling whiteness along with its insolubility make this stone especially favored as a poultry grit.

This bagged stone is shipped to all sections of the United States that lie roughly east of the Rocky Mountains. At the time of inspection a carload was going to Chicago and another to Nebraska points.

For sizing this specialty stone, the company uses one triple deck, and two double deck screens. All are operated dry, and the products are remarkably free from dust and off-sized particles.

The specialty crushed stone is sacked on two Fairbanks-Morse precision open mouth weighing machines that are automatic in their weighing cycle. After the bag is filled it passes via a short belt conveyor to one of two sewing machines that close the top. The sack then goes up a short inclined conveyor that carries the sack to sufficient elevation that it can dump to a hand truck without lifting. A special lever device places the sacks on the trucks without impact. There



Surge bin holding 1000 tons for poultry grit plant is built of dimension stone

are four men to each machine; a sacker, a sewer, and two truckmen. This gives a capacity of about 23 sacks per minute. Filled sacks are trucked directly into cars for the most part. A new warehouse that will enable cars to be loaded under cover is in this year's building program. All cars loaded with paper bags are first lined with heavy paper.

Poultry Grits

According to agricultural authorities an average chicken will eat about 6 lbs. of grit per year. The average time that food is in a chicken's gizzard is said to be about $\frac{1}{2}$ to 12 minutes so if the grit is not sharp, or is not easily available, much food passes through the chicken undigested. Grit acts as the chicken's teeth, so one of the major talking points for a high grade grit is the feed that can be saved the farmer, and the nutritional value obtained from digested feed, by having sparkling sharp grit of the proper size.

Commercial aggregates for concrete can be loaded direct to cars or trucks by chutes from bins, but a considerable portion is loaded by Hough Pay-Loaders from stockpiles. Another bulk product which is growing rapidly in the states adjoining North Carolina, is the so-called "granite chips." These are approximately a minus 8-mesh product with the fines in it. They are being used extensively for making concrete blocks.

Loading in the quarry is done by 1-cu. yd. Northwest shovels that can load to 20-ton capacity dump trucks mounted on Diamond "T" chassis.

Officers of the company at the quarry are: John P. Frank, president; Christopher Binder, vice-president; Frank L. Smith, treasurer; G. Kellock Hale, Jr., secretary; A. Clark Lackey, assistant treasurer; and Dallas M. Owens, assistant secretary.

John A. Simmons is quarry superintendent and Will P. Shelton is cut stone superintendent.



Sacking poultry grits, to the right, and sewing bags, to the left. Note the exhaust pipes which draw off dust from packing machines, making the plant practically dustless

Agricultural Limestone Division, N.C.S.A. Directors Meet in Chicago

(Continued from page 79)

The film was shown at the meeting and is a very convincing presentation of the extreme importance of soil fertility to our national health and prosperity. It features DR. WILLIAM A. ALBRECHT, Chairman, Department of Soils, University of Missouri, Columbia, Mo., as principal actor and features theories that he has proved and for which he has gained national reputation.

Promotion

The Division has again been invited to participate at the National Farm Show in Chicago and the desire of the Board is that the industry again be represented. However, a better booth location is considered essential and a committee will consider the matter of raising funds for rental of suitable space.

Thousands of promotional folders and mats for newspaper ads, including bank ads, have been sold and/or distributed thus far in 1948. Mats have now been supplied, free of charge, to 194 country banks thus far, where the banks have expressed interest in spreading the gospel of soil liming through advertising. Membership now consists of 191 active members and 33 associate members, concluded Mr. Huschke. Three new associate members were announced later. It was voted to use Mr. Huschke's complete report as a promotional piece to exploit the activities of the Division.

Percentage Depletion

The subject of percentage depletion, which the Division is working hard to secure for the industry, was briefly discussed, a very detailed report and prepared presentation having previously been sent to the membership. Apparently, even though the industry is convinced it is entitled to percentage depletion, politics will determine whether or not it will be allowed. Much work must be done by producers individually in contacting and influencing congressmen.

The competition of marl with agricultural limestone has become serious in some localities, notably in Virginia and West Virginia as previously reported by one producer, and the problem came up for considerable discussion. Apparently, deposits of "marl" usable for liming are more widespread than commonly realized and much of it is low grade stuff scooped out of creeks and sold without processing and often with some top soil contained.

A Michigan producer, in commenting on the relative values of marl and agricultural limestone said that marl in his state has been completely eliminated as competition through stress-

ing its low neutralizing value and other shortcomings such as non-uniformity, high moisture content, etc. In Michigan, if marl be used, it is recommended that 2 cu. yd. be required to equal one ton of agricultural limestone. Consensus of opinion was that there is a need for standardization of liming materials according to properties and characteristics required, and the matter is one for consideration by local A.A.A. action.

Lime Plant Design

(Continued from page 76)

arate units to prevent gas or stone cross flow. Thus, the medium stone kiln consists of virtually six small units and that for the smallest stone has eight units, each independent of each other in respect to both drawing and firing control.

Fuel Systems

Of the fuel systems there are quite a few shown in Fig. 4. There is the integral gas producer, not only for coal but also quite suitable for wood gasification, particularly hogged fuel. Then there is the mechanical gas producer, or improved system of direct coal or gas firing. At the present we are designing a special small gas producer which will be part of the kiln as shown at (8).

Then there are the natural gas kilns of center burner type (3), many of these are placed all over the country. Natural gas is about the ideal fuel and one can do the most with kilns when using it as a firing medium. Oil application is not nearly so simple, particularly when the heavily cracked Mexican residue is to be used.

Lately pulverized coal application to vertical kilns (9) is also reviving. It has been used over a great many years but not altogether satisfactorily, some of the early jobs not being properly engineered. Now a determined effort is being made to develop an efficient design, and it seems that something very worth while will come of it.

Lime Handling

In the existing competitive battle it is important, if a lime plant is to be successful, that the labor required be reduced to the lowest possible minimum. Therefore, all unit operations must be mechanized to the full extent. In Fig. 5 the various lime handling systems are shown. Of these that of (3) and (5) are best with (5) being the most to be desired. In this case the draw gates are of the magnetic vibrator type, operated by the fireman by remote control from the firing floor, or automatically by an electric time clock mechanism.

All of the other systems were also used on Azbe kilns through the many

years in the past but, while occasionally for simplicity's sake are demanded, none of them have near the advantage of (5).

Conduct Conference Series On Company Management

W. A. WECKER, president, Marquette Cement Manufacturing Co., Chicago, Ill., recently conducted the fifth in a bi-weekly series of management conferences now held regularly at each of the five Marquette plants as part of the company's Management Development Program. Mr. Wecker explained to foremen groups the exact "where from, why, and how much" of all business dollar income and outgo. Highlight of the discussions was the breakdown of each item in the company's 1947 Annual Report on a per employe basis.

California Cement Production

CEMENT PLANTS in California produced 22,790,000 bbls. of finished product in 1947 and shipped 22,838,000 bbls., bringing stocks down to 590,000 bbls. at the end of the year, it was reported. The 1947 production was 16 per cent higher than that of 1946 when output was 19,545,000 bbls. At the same time, shipments were up 12 per cent from the 20,182,000 bbls. shipped in the previous year.

The increase in production is attributed largely to ability of plants to secure repair parts and supplies more readily, and perhaps to some improvement in labor supply.

Silica Plant Expansion

PENNSYLVANIA GLASS SAND CORP., Lewistown, Penn., spent approximately \$1,250,000 during 1947 in plant expansion to take care of an increased demand for silica. At present, a new silica pulverizing mill is being built at Berkeley Springs, W. Va., which should be completed by the end of the year, and will represent the largest single unit operated by the company, doubling capacity.

In addition to its expansion program the company last year acquired a small silica producing plant at Mill Creek, Okla., together with large silica deposits suitable for manufacture of the finest quality crystal and sheet glass, as well as for use by the ceramic and chemical industries, a report states. Capacity of this plant also is being expanded.

Reopens Phosphate Property

PHOSPHATE MINES, INC., has reopened phosphate property at Kemmerer, Wyo., Duard Crockett Wray, president, announced, and is now prepared to deliver high grade phosphate rock, guaranteed 30 per cent-plus P₂O₅ content, crushed to minus 1/2-in. Plans also are being made to deliver phosphate rock milled to minus 100 mesh, suitable for dusting on crops.

Rock Wool

By BROR NORDBERG



Rock wool plant recently placed in operation. Material handling bins, to the right

Recover WASTE HEAT From Cupolas

**Tex-Ark Rock Wool Corp., Texarkana, Ark.,
operates rock wool plant designed for maximum
fuel economy. Preheat combustion air**

THE MINERAL WOOL INDUSTRY has been making rapid strides toward the achievement of great economies in plant operation, and notably through the utilization of waste heat from cupolas. Newer plants of well-financed concerns are now realizing fuel ratios as high as 6:1 or even close to 7:1, using coke of 13,500 B.t.u. average heat value and slag as the principal raw material. Such performance represents approximately half as much fuel consumed per ton of product, in evaluating relative performance with plants built just a few years ago.

These figures are being attained

principally through preheating the combustion air injected into cupolas, together with the use of preheated boiler feed water, and through employment of insulation and other conservation devices.

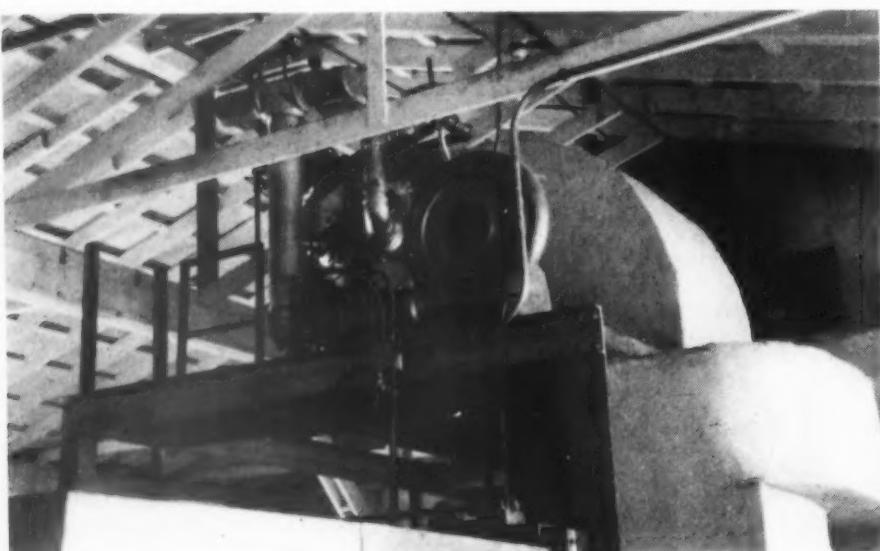
The new plant of Tex-Ark Rock Wool Corp., Texarkana, Ark., which started production in March of this year, is representative of most advanced practice in fuel conservation. Gases are drawn from the cupola at elevated temperature, and the latent heat of the CO₂ fraction plus the ignition of the CO portion into CO₂ provide most of the heat for firing the

boiler; combustion air is preheated; and "spent" exit gases which have served to preheat the combustion air are to be utilized to provide part of the heat in the drying ovens on the batt line. Much has yet to be completed (such as the application of insulation to the cupola and the adaptation of the heat in the exit gases for drying and setting wool batts or possibly in the removal of moisture from raw materials in bins, etc.) to attain the degree of perfection desired. A fuel ratio of 6:1 has been obtained from the start of operations.

Aside from these features of the plant which we consider particularly noteworthy and stress herein, the entire operation is new and represents the latest practice throughout. The plant has a single cupola and was designed to produce 50 tons of wool in 24 hr. when full production is attained, with provisions for doubling the plant capacity later, should sales justify. Products are loose wool granular and batts. Most of the wool production is fabricated into batts by a continuous and automatic process.

Located within the city limits of Texarkana, the plant has access to the Missouri-Pacific, Texas and Pacific, Kansas City Southern and Cotton Belt railroads, and has truck-loading facilities as well, to serve markets in the Southwest. It is housed in a building constructed of steel and sheet metal, and the balance of frame and sheet steel (storage area) occupying 25,000 sq. ft. of floor space.

Specialists in rock wool manufacture and equipment cooperated in the



One of the gas-fired ovens for drying batts.

ROCK WOOL

design of the plant under the general directorship of J. K. Duncan, consulting engineer, who was responsible for the over-all engineering design, and who was assisted by company engineer V. C. Doctorman in the basic design. Whiting Corp. designed and furnished the raw materials handling layout, cupola charging equipment and the boiler. W. Bros Co. built the boiler and cupola according to Whiting specifications. Despatch Oven Co. provided the production line for batt manufacture including the collecting chamber, oven and cooler sections, and The Rock Wool Engineering & Equipment Co. designed and manufactured the batt machine at the end of the production line. The entire operation is one of straight line production from the cupola, 160 ft., to the far end of the plant, where batts are cut to size, packed in cartons, and loaded for shipment or placed in storage. In method of batt manufacture, the plant is typical of the more modern plants built completely new; a notable exception being that wool may be diverted, just ahead of the forming rolls on to a canvas conveyor line, to the granulating and bagging equipment.

Raw Materials

At first the company acquired a limestone quarry near Foreman, Ark., as a source of raw materials, but the relative economy of fusing slag has made it advisable thus far to ship in slag by rail from the Monsanto Chemical Co. plant at Nashville, Tenn. This is a phosphatic slag ranging from about 4 in. top size down, to include a small fraction of fines. Its analysis averages approximately 40.2 per cent SiO_2 , 40.8 per cent CaO , 9.5 per cent Al_2O_3 and it contains small percentages of calcium fluoride, iron oxides, magnesium oxide and titanic oxide. Approximately 7 1/4 per cent of silica gravel is added to the charge, when manufacturing wool batts, to increase the viscosity and thereby blow a long-



Raw material bins. Note transfer belt from rail hopper to elevator

er fiber. This is a 3 in., 96 per cent silica gravel obtained from the nearby commercial sand and gravel plant of Gifford-Hill & Co. Coke of 82.5 per cent fixed carbon and approximately 8 per cent ash is shipped in from Daingerfield, Texas. Its heat value is 13,000-14,000 B.t.u. per lb., and average moisture as fed into the cupola is 5 per cent.

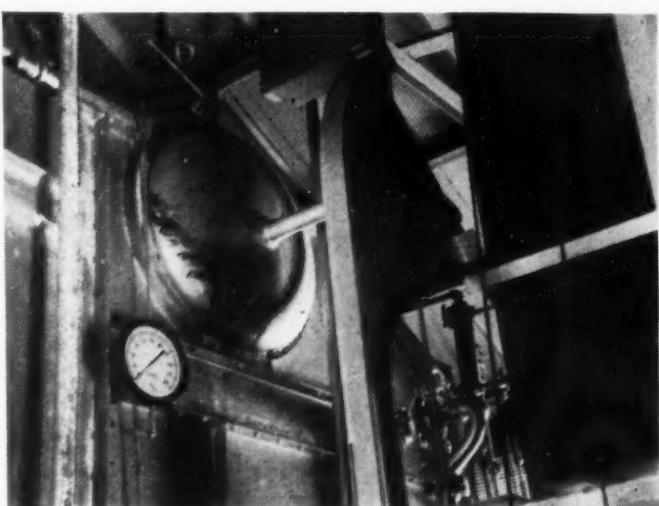
Slag and coke are received by rail on a siding adjoining the plant and are transferred by horizontal belt conveyor into a hopper for elevation by bucket elevator, via turnspout, into either of four bins arranged in a row transverse to the main building at the cupola end. The bins hold six carloads of materials and permit blending of slag and gravel over a single 24-in. belt conveyor which delivers into a 22 1/2-cu. ft. charging skip at the base of the cupola. Coke is similarly handled but separately, since the alternate layer method of charging is employed instead of mixed feed which may be tried to determine relative fuel consumption. Individual Jeffrey-Traylor electric vibrating feeders pay

out from each bin to the belt. Their operation is timed automatically by an electric limit switch to run out a definite quantity of feed material for a batch. The belt conveyor is started and stopped independently. Continental Gin Co. supplied the conveyors and elevator. Batches of 1600 lb. of slag plus 125 lb. of silica gravel and, alternately, 300 lb. of coke, are charged into the top of the cupola every 20 minutes.

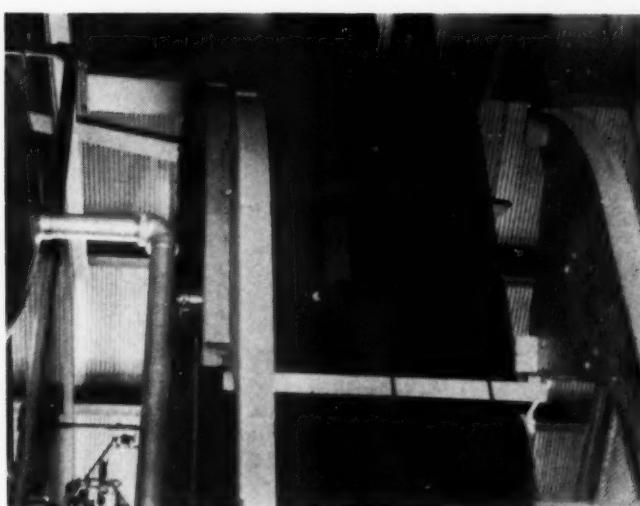
Cupola-Boiler

The cupola and boiler were designed to operate as a unit with economy of fuel the objective through use of cupola gases for firing the boiler and to preheat incoming air for combustion, and use of cooling jacket water for boiler feed water. Auxiliary equipment includes an air intake blower for forced draft cupola operation, an induced draft fan for drawoff of heated cupola gases and circulation (suction) through the boiler and an air preheater integral with it, and a boiler feed water pump.

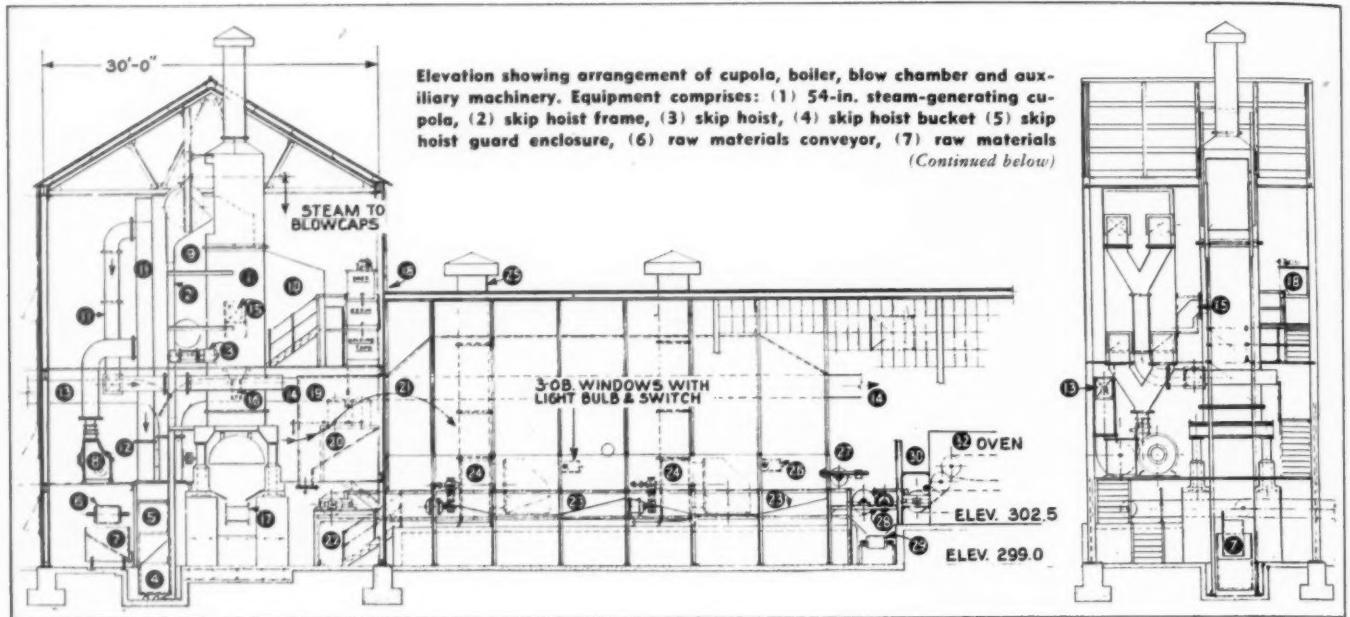
The cupola is 54-in. inside diameter,



Left: Partial view of boiler, showing upper drum which receives "liquid steam" from cupola water jacket. Right: Showing skip rails and dumping mechanism into cupola-boiler, to the left



ROCK WOOL



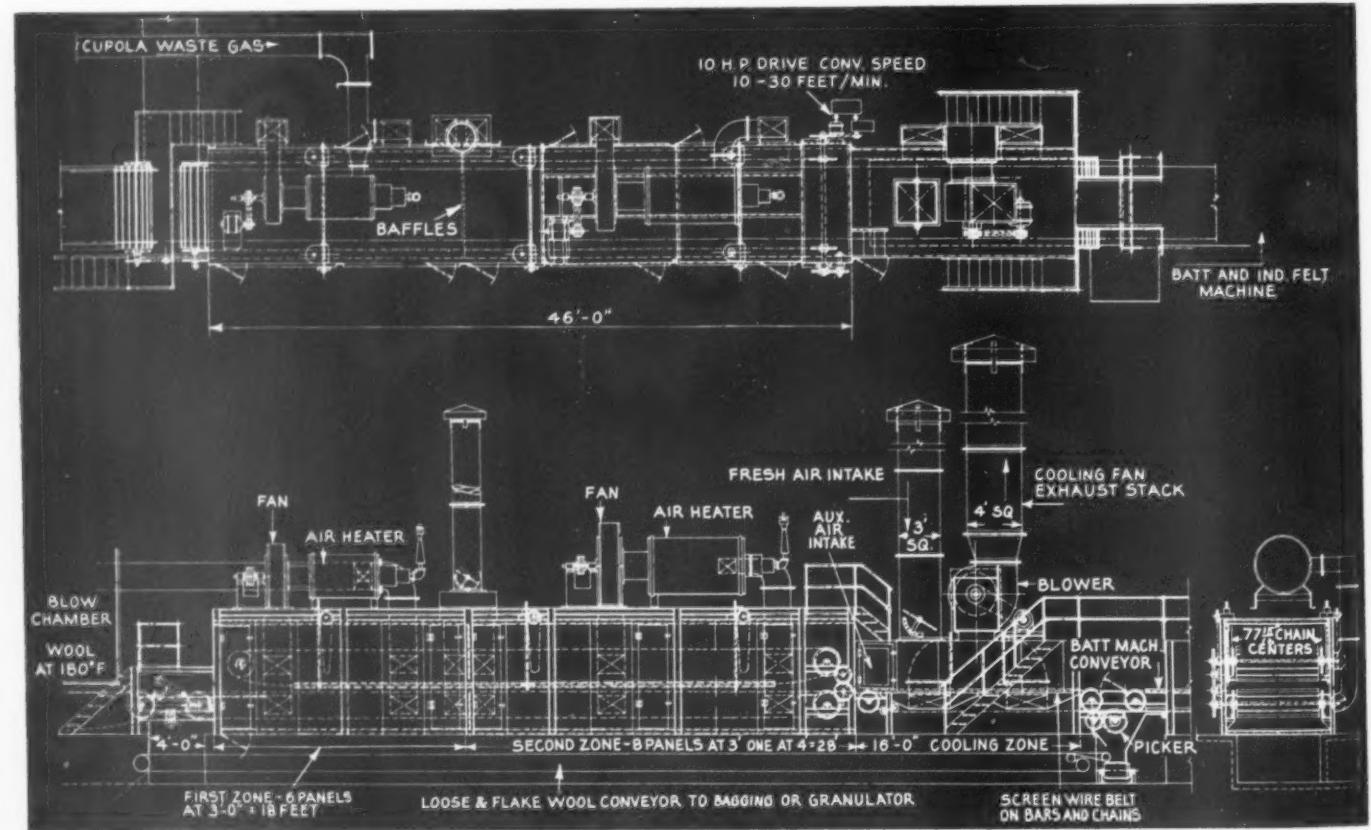
chute to skip bucket, (8) blower, (9) waste heat boiler, (10) gas-fired dutch oven, (11) preheater and duct to wind box and tuyers, (12) boiler fan and duct from preheater, (13) waste gas duct to silos, (14) waste gas duct to oven, (15) hot gas portal from cupola to boiler, (16) boiler ash spouts, (17) boiler ash and cupola dumpings conveyor (future), (18) synthetic resin treatment equipment, (19) blowchamber, (20) shot baffle, (21) path of fiber, (22) slot conveyor, (23) self-cleaning down draft ducts, (24) down draft fans, two, (25) down draft stacks for fans, (26) observation windows, (27) press and seal roll, (28) wool picker, (29) wool cross conveyor to granulator, (30) cross-over walkway, (31) blowchamber drive, (32) oven

with 8 ft. 4 $\frac{1}{4}$ in. inside diameter windbox and measures 35 ft. high. An unusual feature is that it has a 4 $\frac{1}{2}$ -in. water jacket measuring 7 ft. 3 in. high from a level just below the windbox, that is a pressure section and designed to withstand the working

pressure of the boiler. Below the pressure section the false bottom, 14 in. high, is water-jacketed. The bottom of the cupola is elevated on legs for ready cleanout of ash and cupola dumpings from the false bottom. The interior of the shell is "corrugated"

to minimize bridging and to allow for expansion.

Raw materials are charged into a receiving hopper at the top of the cupola by skip bucket. They enter the cupola through a charging belt, hydraulically operated, which is tripped



Elevation and plan of oven arrangement for mineral wool bats

ROCK WOOL

to open and close automatically by lugs on the charging skip which actuate open and close levers. Purpose of the charging bell is to seal the top of the cupola, to minimize the escape of gases during the charging operation in order to recover as large a volume of heated gases as possible for firing the boiler and to preheat induced air for firing the cupola. Spacing between the skip tripping lugs is 26 in. and travel of the hoist is 60 f.p.m. The bell remains in open position 2½-3 seconds for each charge, the time required for the bottom lug on the descending empty skip to trip into "open position" to drop the charge from the overhead hopper and then for the top lug to cause the bell to close.

Ultimately the cupola is expected to produce two tons of wool per hour, calculated at 500 lb. of wool per blowcap with eight in operation. At present, six blowcaps are in production, and eight of fifteen tuyeres for introduction of combustion air are in service. The blowcaps and divider plates are of ordinary wrought iron.

Steam for blowing wool fiber is developed by a W. Bros. 100-hp. vertical water tube boiler, 6000 lb. per hour steam capacity, operating at 160 p.s.i. working pressure in conjunction with the pressure section of the water jacket.

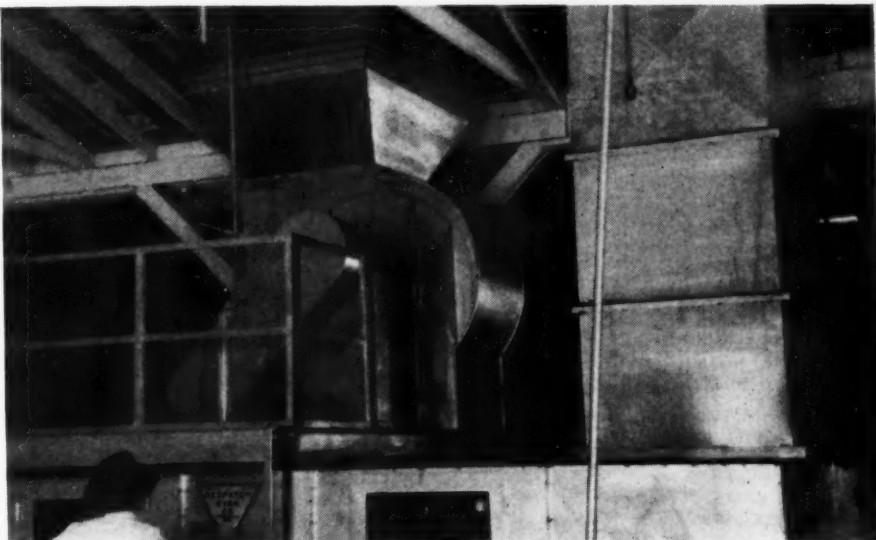
The boiler consists essentially of a top water-steam drum and a lower water drum with vertical water tubes, and an air preheater section at the back end for preheating incoming cold air. It is fired by natural gas in a refractory-lined Dutch oven, supplementing the heat derived from the introduction of heated cupola gases and that developed by burning CO gas into CO₂.

Cupola-Boiler Operation

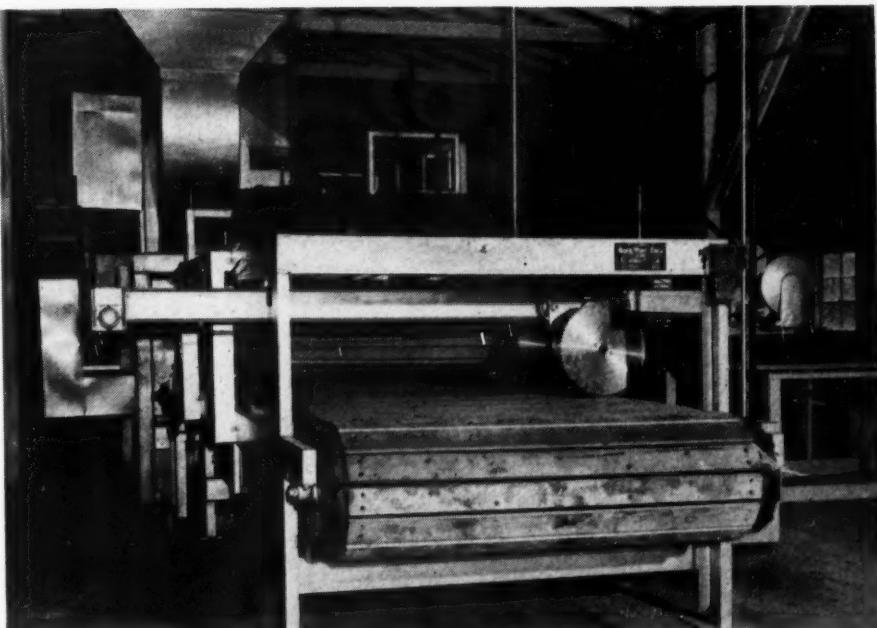
The combination of cupola and boiler functions much like a steam generator. Steam is desired at 90 p.s.i. pressure at the blow caps to fiberize the melt and blow the fibers against a shot baffle at entrance into the wool chamber. Temperature of the melt is held at 2500 deg. F. at the blow caps or about 2600 deg. F. at the notch above the divider plates. Designed capacity provided for utilization of 4000 lb. of steam per hour, 500 lb. for each blowcap, requiring 500 g.p.h. of water to be introduced continuously into the system.

Water flow is automatically controlled and its circulation is through the system by the boiler feed water pump. Pressure on the boiler regulates pump operation and makeup water from the city lines is admitted into the feed water tank through action of a float.

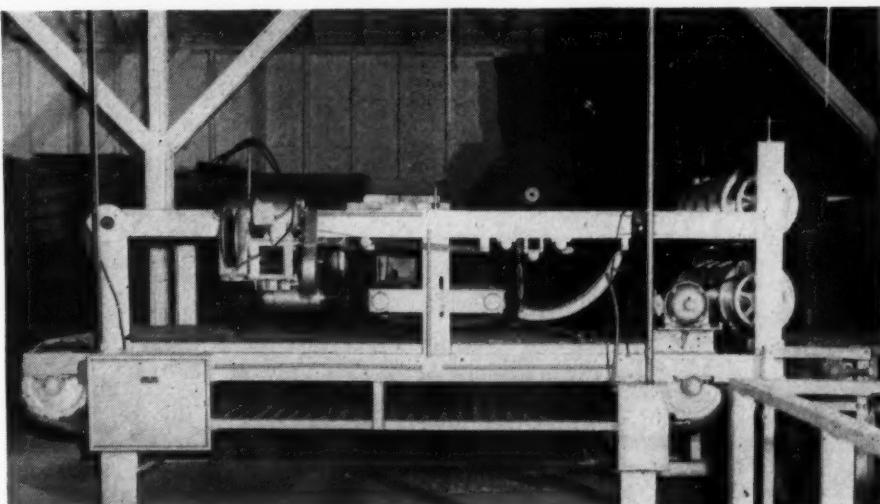
Fresh water enters the tank, is circulated through the annular water jacket surrounding the false bottom of the jacket, and is preheated and circulated back into the tank, where



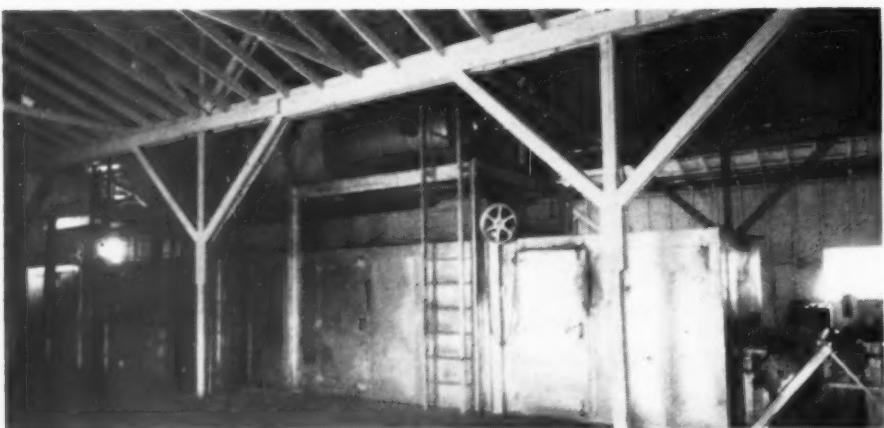
Cooling section of batt production line



End view of batt machine conveyor showing cut-off mechanism



Close-up side view of cutting section showing longitudinal and transverse cutting knives



Close-up of oven section of batt production line. Cutting knives are to the extreme right

it has a temperature of 180 deg. F. It is pumped into the top drum of the boiler, from where it is circulated down through the boiler tubes into the bottom drum, from which it is forced into the pressure section of the water jacket.

Temperature of the water (under pressure) is 260 deg. F. upon entry into the water jacket and it increases to 330 deg. F. upon returning into the top drum of the boiler to complete the circuit. Actually the water is liquid steam, under 160 p.s.i. pressure which upon entry into the

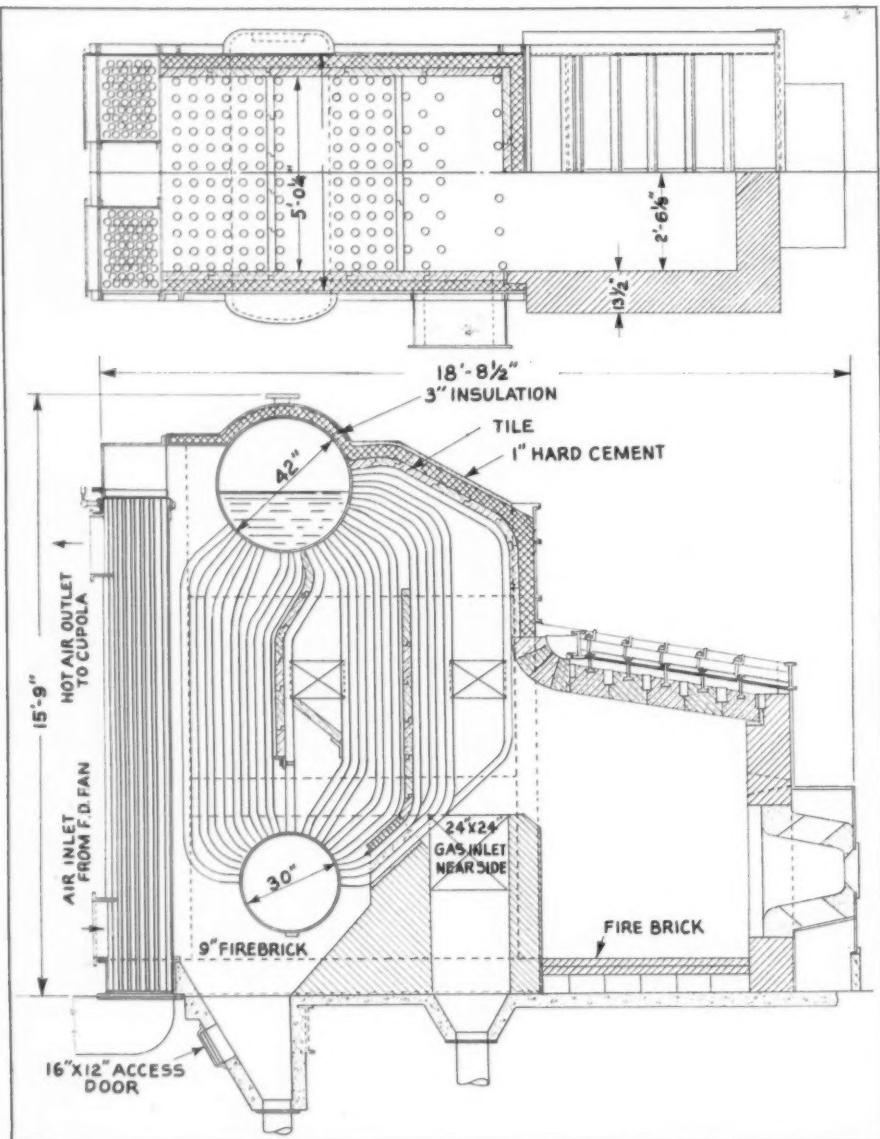


Left to right: J. M. Lile, president; Paul Lile, general manager; V. C. Doctorman, engineer

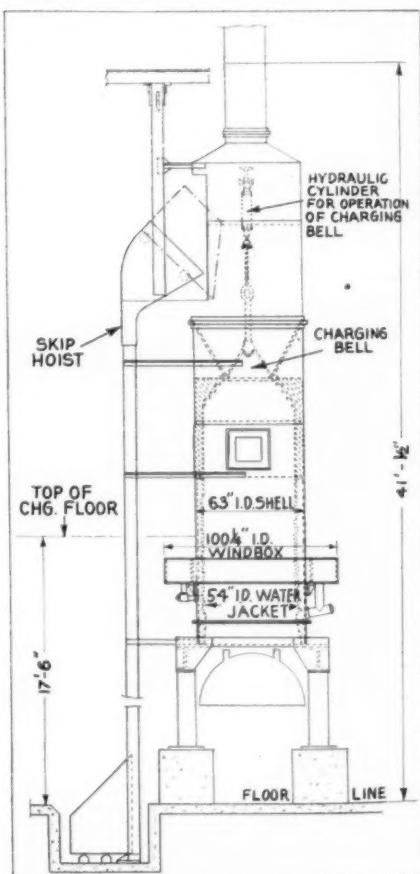
drum converts to steam instantaneously.

The boiler must furnish additional heat to develop the quantity of steam required at the desired pressure and, apparently, the steam is superheated in the process which probably contributes to the low percentage of shot evident in the wool manufactured. Dry steam is contributory to low production of shot.

Most of the heat units to fire the boiler derive from the cupola gases. An induced draft suction fan draws off gases from the cupola at a level 15 in. above the top of the water jacket some two feet above the maximum level of the charge, and draws them into the boiler firebox, around the water tubes and then through the tubes in the preheater section to heat incoming cold air before the fresh air



Waste heat boiler. Preheater section for heating combustion air from heat in kiln exit gases may be seen, to the left



Rock wool cupola and charging skip hoist

ROCK WOOL

is injected into the cupola through the tuyeres.

Induced draft for combustion in the cupola is taken in at room temperature and forced by a centrifugal blower via a Foxboro air weight control into the bottom of the air preheater around the tubes through which cupola gases are passing, and out the top of the preheater through a duct into the cupola windbox. About 2200 c.f.m. of air at 90 deg. F. is expanded to 2800 c.f.m. when preheated to 360 deg. F. before entry at 6 oz. pressure into the cupola windbox.

The suction fan on the boiler draws off 7900 c.f.m. of gases from the cupola into the boiler firebox at a temperature of 800 deg. F. as measured in the duct to the boiler. Gases analyze 14 per cent CO and 16 per cent CO₂. CO gas is burned into CO₂ at 1000-1200 deg. F. and just enough natural gas is burned to elevate the gas temperature to that figure. Thus CO is the principal fuel and is supplemented by the latent heat in the CO₂ gas. The gas burner is maintained at low flame constantly, to ignite the CO into CO₂ and will be automatically operated to cut in, through action of a thermocouple.

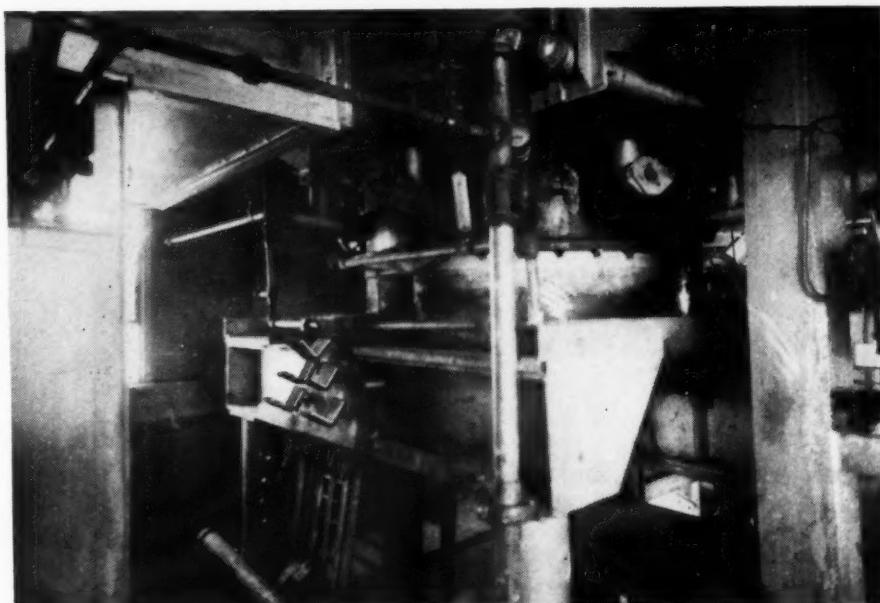
In addition to the foregoing utilization of waste heat, "spent" gases exhausting at 325 deg. F. from the air preheater tubes are to be harnessed and their heat further extracted. A long duct from the preheater to the driver batt ovens has been installed to utilize these gases to supplement heat from gas burners to "set" the batts. An alternate use may be to pipe these gases into the slag bins to extract some of the moisture before feeding slag into the cupola.

Great economies in fuel are being realized. It is estimated that 65 per cent of the fuel requirements of the boiler are extracted from cupola gases. Preheated air for combustion in the cupola is instrumental to a saving of 20 per cent in coke. The cupola is to be insulated to its entire height.

Wool Fabrication

Fibers are blown into a wool collecting chamber and are conveyed forward in the usual way to be processed into batts or granular wool or to be bagged as loose wool. Most of the production is of batts. When manufacturing loose wool or granular wool the mass, upon being conveyed out of the blow chamber by woven wire conveyor, is dropped to a canvas conveyor belt below floor level and diverted from the production line to picking, granulating and bagging equipment.

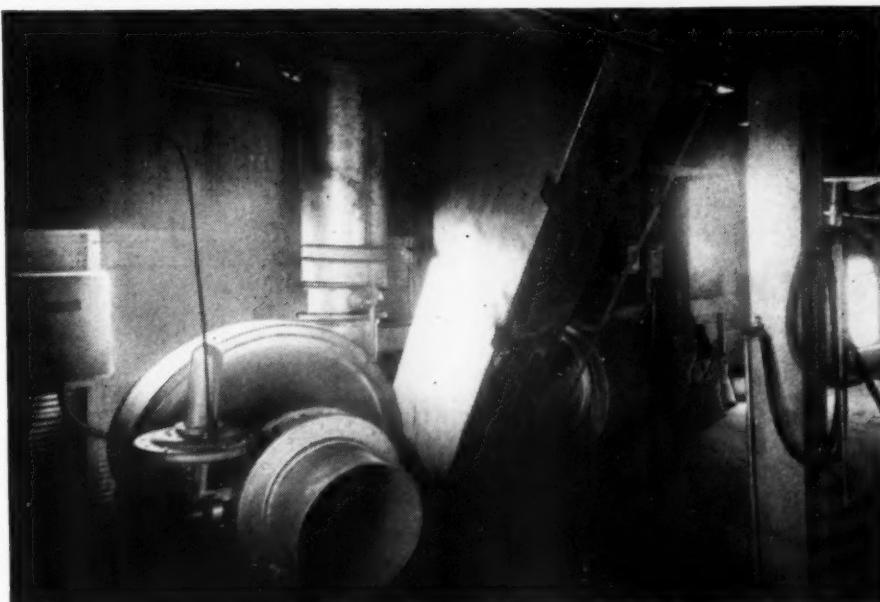
The standard batt measures 15- x 24-in. and is manufactured as a full thick^{*}4 in. resilient product of 2½-in. semi-thick. Capacity is 100,000 sq. ft. of 4-in. batts in 24 hr. Additives for resiliency contribute to a batt that, when compressed one-third, will spring back to 90 per cent of original thickness. Free shot is less than 8 per



Close-up of cupola (not operating) showing blowcaps on the left and wind box, above



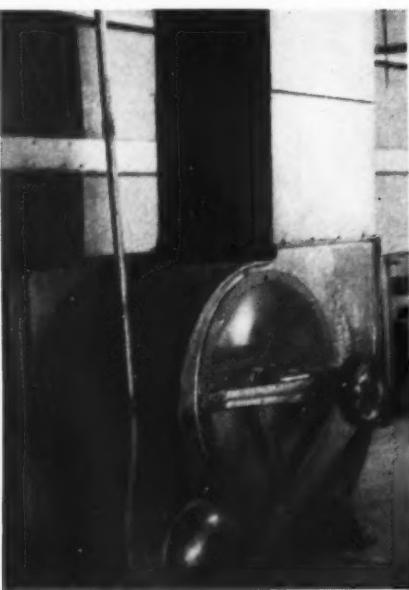
Showing vibrating feeders and blending belt for draw-off of materials from bins and charging skip



Air intake fan for cupola firing, left; induced draft fan for boiler, right



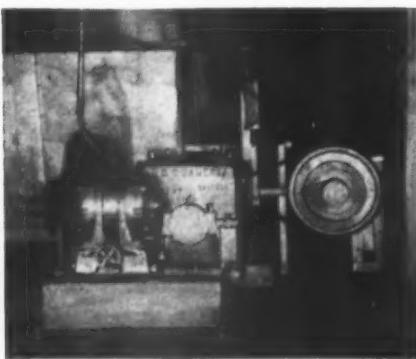
Dividing plates to split stream of melt



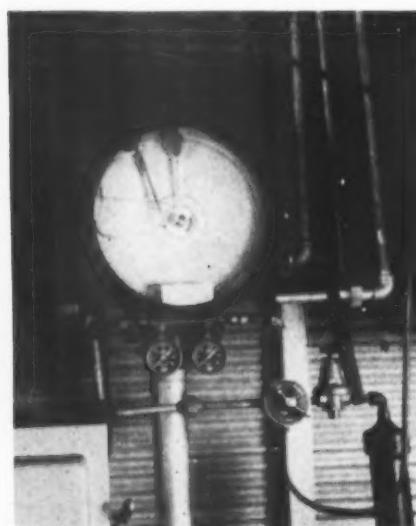
Boiler induced draft fan



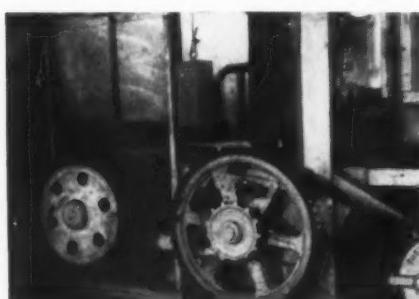
Close-up of two electric vibrating feeders



Variable speed drive for batt production line



Air weight controller on cold air



By-pass at outlet from collecting chamber to divert wool to conveyor below for making loose and granular wool

James gear drive powers the entire conveyor line at a speed range from 10 to 30 f.p.m.

J. M. Lile, president of the company, was formerly in the lumber business in Fort Smith, Ark. He founded Tex-Ark Rock Wool Corp. in recognition of a need for mineral wool insulation in the southwest where air conditioning is becoming prevalent and the insulating "out" of heat is a problem to be faced generally in buildings and homes. R. W. Gregg is secretary-treasurer; Paul Lile, general manager; V. C. Doctorman, engineer; and Loyd V. Sullinger, sales manager.

Stockpiling

(Continued from page 75)

about evenly split between concrete and hot-mix plants.

Semi-Portable Construction

As the only permanent installation at this plant comprises the comparatively small concrete footings under the superstructure carrying machinery and belt conveyors, the plant can be readily knocked down and moved to a new location when pit excavation makes the distance from the plant too great for economic extension of the swing conveyor. Another equally important reason was the need to conserve manpower. The new plant is a two-man operation: one man at the dragline, the other operating the plant. An electrical control house, mounted on one side of the plant superstructure, contains switches for controlling the entire operation. Every detail of plant operation is visible from either of two decks, located at opposite ends of the control house.

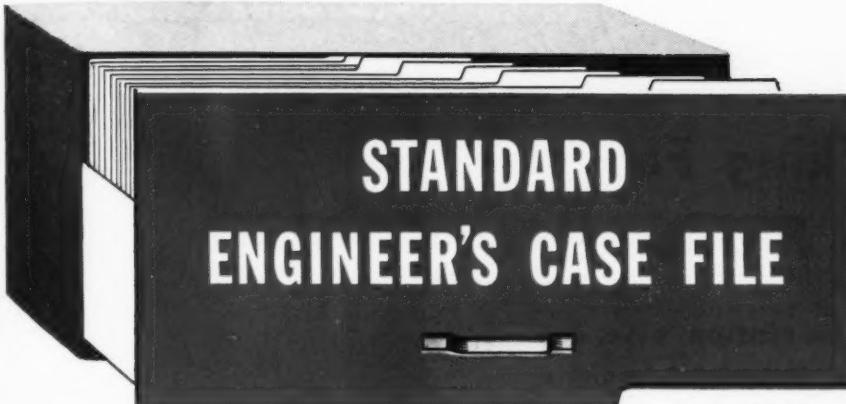
Officers of the Wapak Sand & Gravel Co. are H. G. Heffner, president; John Brands, vice-president; and W. Platt Greer, secretary-treasurer. The company has been in business 20 years, and ample sources of supply are available to operate another 20 years from the two plants.

Nonmetallic Mineral Resources of Nebraska

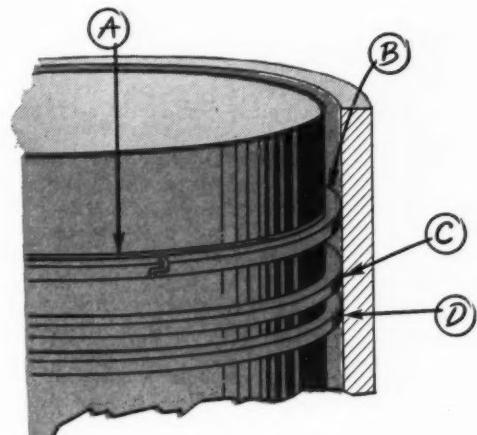
RELEASE of Missouri Basin Studies No. 15, titled "Construction Materials and Nonmetallic Mineral Resources of Nebraska" has been announced by the Geological Survey and may be obtained from the Director, Washington 25, D. C., at a cost of 40¢.

Predict Record Cement Production

PRESIDENT GEORGE C. TREAT, at a recent shareholders' meeting of Bessemer Limestone & Cement Co., Youngstown, Ohio, predicted that 1948 shipments will exceed the 1947 record, and contended that demand for crushed limestone as blast furnace flux will continue at a high level as long as steel demand continues.



CASE D119A--MAINTAINING FULL POWER IN DIESEL ENGINES.



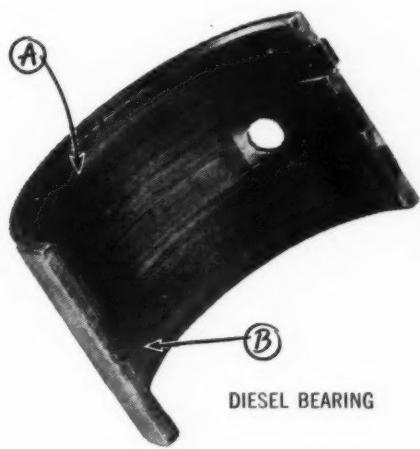
SECTION OF DIESEL ENGINE PISTON

Operators of Diesels in all types of service report RPM DELO Diesel Engine Lubricating Oil materially reduces power loss in three ways:

- A. Detergent compounds prevent ring-sticking, allow full ring tension against cylinder wall, and this minimizes compression loss.
- B. Metal-adhesion additive keeps full oil film on hot upper cylinder walls. These danger areas are often left unprotected by many oils.
- C. RPM DELO Oil maintains a tough oil seal that stops blow-by of combustion gases.
- D. An anti-oxidant increases the inherent stability of RPM DELO Oil's selected base stocks and resists lacquer formations on liners and piston skirts.

Other additives in this pioneer compounded oil prevent foaming, and control gum formations.

CASE D119B--PREVENTING FREQUENT BEARING REPLACEMENT DUE TO CORROSION.



DIESEL BEARING

In normal operation, Diesel engines require excess oxygen and operate at high temperatures. Under these conditions many unstable lubricants tend to turn corrosive and attack the lead in the copper-lead structure of alloy bearings. RPM DELO Diesel Engine Lubricating Oil is especially compounded to prevent this cause of bearing failure.

- A. Selected base stocks are used that are naturally resistant to oxidation, the cause of most bearing corrosion.
- B. Anti-oxidation compounds in RPM DELO Oil further reduce the danger of corrosion.

In laboratory corrosion tests, copper-lead bearing strips immersed in RPM DELO Diesel Engine Lubricating Oil showed considerably less weight loss than those protected by similar type oils.

For additional information and the name of your nearest Distributor, write

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Industrial Sand

More Efficient Packing Facilities Sought By Sand Producers

National Industrial Sand Association also discusses compensation insurance, industrial hygiene, car supply, and appoints new traffic committee

IN SPITE of the threatened railroad strike, the National Industrial Sand Association held its annual meeting at the Homestead Hotel, Hot Springs, Va., on May 12, 13 and 14 with a good attendance. As in the past, the wives and families of the producers played a considerable part in making the meeting a success. This group, while relatively small in numbers, is very active and vigorous in their attempts to find solutions for problems common to them all.

New Officers

The following officers were elected: George A Thornton, president; Sterling N. Farmer, vice-president; C. M. Hardy, treasurer. Directors elected were: J. S. Coxey, Jr., E. M. Durstine, Clarence R. Wolf, James Bergs, and Arthur Schlesinger.

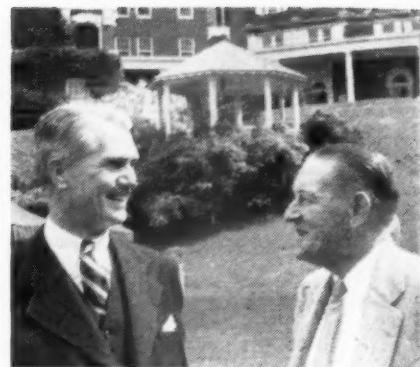
With HENRY C. THORNTON acting as chairman at the Wednesday morning session the members discussed the proposal that the association help finance development of a more efficient packing machine.

STANTON WALKER, serving as consulting engineer for the group, showed several drawings of proposed machines that were prepared by the St. Regis Paper Co. He pointed out that there were about 52 machines of the old type now in operation in

the industry and for anyone to develop a more suitable machine financial assistance would have to be extended in some form or another.

In the four types of machines he discussed it was brought out that a "stop-start" mechanism would be featured. This entailed devices that would allow a short rest period after the sack was filled so that any back pressure or "blow-back" would be eliminated and that the filling mechanism would only function when the sack was actually being filled. This latter, he said, was intended to reduce the wear and might make reductions here as much as 90 per cent.

Design "A" was a conventional machine with the start-stop mechanism utilizing hard metals and hinged doors over the spout assembly. It provided for the rest period so the bag would be completely deflated before removal. It would have four spouts and would require 26 seconds for four bags, or nine bags per minute. This design, as in all the designs submitted, slowed down the sacking operations considerably. The time cycle of the filling operation would be about as follows: 2 seconds to open doors, 10 seconds to put bags on, 2 seconds to close doors, 7 seconds to fill sacks, 5 second rest period to deflate bag; a total of 26 seconds.



Geo. Thornton, newly elected president, left, talking things over with retiring president, A. Y. Gregory

Design "B" was somewhat along the same lines except that the protective housing slides in and out. It had the same time-filling cycle as above.

Design "D" resembles the 12 spout F. L. Smith & Co. design. On this machine the bag is placed on the spout and the unit moves 90 deg. of a circle and is half-filled. Then the sack moves to the 180 deg. position, and is filled and weighed. At 270 deg. position the sack is discharged. All this operation is in a suitable tight housing. It has a rate of about 10 bags per minute, it was pointed out.

Design "C" seemed to be the favorite plan submitted and the most flexible. It was pointed out that it could be in the 2-bag, two-three and two-four bag-size and could be adopted for 100 or 80 lb. bags. He indicated the industry may come to 50 lb. bags later. This design involved a moving housing over the spouts and with a three-second rest period would turn out 12 bags per minute on a three-bag machine. With an eight-second rest period the production would be nine bags per minute. A belt conveyor system to receive the filled sacks, dust collection, surge bins, bin indicators for a constant head of material on the tubes—these were fundamentals with this design.

For a 6-tube (two 3-tubes), the cost for the machine alone would be about \$12,500 but the dust enclosures, surge bins and related equipment to make a dust-free operation would run the cost to an estimated \$26,000 for this type of design. Plan "A" would total about \$18,000. Plan "B" \$19,000, and Plan "D" \$20,000.

Mr. Walker suggested that to anyone present interested in this development, he would be glad to supply rough drawings of these various designs. He also mentioned that at the Birmingham, Ala., and the Dallas, Texas, plants of the Lone Star Cement Corporation, modern, dustless pack houses were now in operation.

Executive Secretary VINCE AHEARN pointed out that the industry was so small that it probably could only absorb 20 to 30 machines so that some

(Continued on page 98)



Group of ladies on one of the interesting tours visited White Sulphur Springs, W. Va.

INDUSTRIAL SAND



Mr. and Mrs. Ed. Sawyer



Mr. and Mrs. John H. Newhouser



Mr. and Mrs. Arnold Tanzer



Mrs. Forrest S. Pearson

(Continued from page 96)
form of financial assistance might have to be extended. Many seemed willing to do this but with reservations, such as refunding \$1000 for each of these machines sold outside the industry, for, they pointed out, the abrasives, ground coke, clay and other industries could use dustless equipment to advantage. Others thought, in view of the dollar value of the bags (paper) purchased by this group, that adjustments could be made on that basis. It was brought out that possibly only a dozen of the group were now interested in the development of a better packer, and with them radical re-designs of their pack house—to provide more head room, for instance, would be necessary. It was brought out also that the St. Regis Paper Co. would own the patent rights to the machine. No definite action was taken on the proposals.

Dates of Coming Meetings

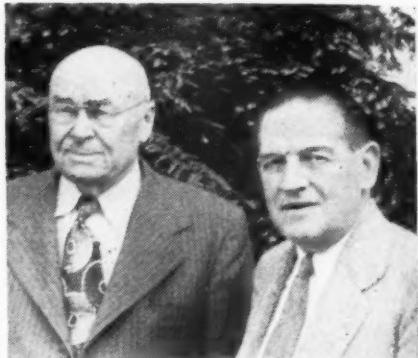
The financial report was then given the members, with A. Y. Gregory presiding for the balance of this session. At this time it was mentioned that the next meeting would be October 20-21-22 at the Greenbrier Hotel, White Sulphur Springs, Va., and the May 11-12-13, 1949, meeting would be at the Homestead Hotel at Hot Springs, Va.

Safety in Sand Blasting

Printing a manual relating to "Maintaining Safety in Sand Blasting" was the next topic for discussion led by A. Warsaw and Stanton Walker. Mr. Walker asked that members, or those interested in getting copies of the final publication, make final commitments to him by letter so that he could better gauge the number to print. The actual cost of the printing would depend much on the number printed but indicated that it would be in the 20 to 25 cents per issue range. It was decided to get up a master list of those who would normally receive the manual (schools, colleges, insurance companies, libraries, state health departments, foundries, jobbers, individuals, etc.) so there would be a lessening of duplication of mailing. Then each member could order the number he desired and could place them in his area without fear of a duplication of effort. It was indicated that at least 10,000 copies would be printed, plus the number on the master list. A price of \$2 would be printed on the manual, not that it would cost the members that amount, but some thought that such a figure printed on the bulletin would give it a better appearance of value.

STANTON WALKER then gave a brief report on foundry sands saying that dust control at the loading (car) was an individual problem but that efficient portable dust collectors of the

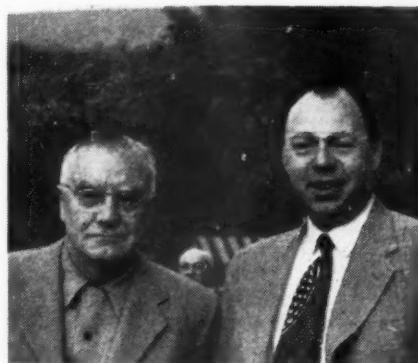
(Continued on page 100)



E. J. Campbell, left, chatting with A. Y. Gregory



Lyle Manley, left, and C. M. Hardy



Stanton Walker and Geo. F. Pettinos, Jr.



Forrest S. Pearson



Barber Greene

more capacity

more speed

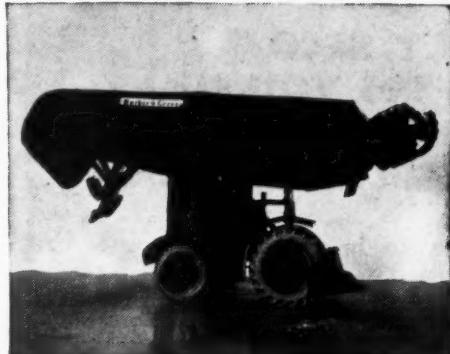
more usefulness

THE 545A BUCKET LOADER

Every feature in the rugged Barber-Greene Model 545A Bucket Loader helps you to get more yards moved per hour, more jobs done per day.

For instance: there are primary and secondary transmissions . . . a separate crowding clutch . . . three forward speeds . . . a quick reverse. The 8-foot synchronized spiral feed keeps the hard-lipped buckets filled to capacity. Double-wheel drive through big, heavy-duty tires means positive traction and extra power. And you'll like the three-point chassis mounting . . . the light-handed steering.

Ask your B-G distributor for the whole story . . . you'll want to put a Model 545A on your payroll.



FAST ON THE ROAD, TOO

It's a great time-saver—fast on the road, fast on the job. Notice how the boom nestles horizontally for transport, and how it reduces overall height. Boom can be tilted onto saddle quickly and easily without using a wrench. Takes only a few minutes to get ready to move.



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PERMANENT CONVEYORS



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COAL MACHINES



BITUMINOUS PLANTS



FINISHERS



DITCHERS

**...here's how to screen
more tons
per hour—**



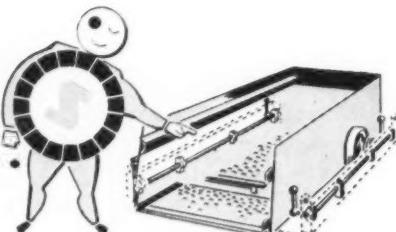
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**ONLY SECO
OFFERS YOU FULLY
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- Try to break a swimming record — with water-soaked clothes clinging to your body — holding you back? Ridiculous, yes.
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**SCREEN EQUIPMENT COMPANY, INC.
Buffalo 21, N. Y.**

In Canada: United Steel Corp., Ltd., Toronto

Industrial Sand Meeting

(Continued from page 98)

cyclone type may soon be available. He mentioned one that was 9- x 12- x 30-in. that would handle 400 c.f.m.

Compensation Insurance

THEODORE C. WATERS, Association Counsel, then took up the "Recent Actions in the States Which Affect Workmen's Compensation Insurance."

He discussed informally New Jersey activities, pointing out that health authorities and labor should get together and work out a uniform code. In Pennsylvania, he mentioned that the health departments had started making health surveys at various industrial plants. GEORGE F. PETTINOS, JR., said that at one of their plants such a survey was made. R. S. LEBOLD said that surveys had been made in Michigan but no medical data requested—only time studies and dust counts. THEODORE F. HATCH, Industrial Hygiene Foundation said that industry should get the facts relating to this phase of their industry and that this work should be encouraged and that it was a healthy sign. He said the state authorities should not bypass management and go direct to the plant superintendents. Mr. Ahearn pointed out that in the event of a World War III, activities in this field would probably be stepped upwards.

Mr. Waters said that it was better for members to talk direct to assemblymen in individual states relating to any legislation affecting their business; that most men in the state legislatures welcomed such talks and that these would be far more effective than talking through the voice of a professional politician or lobbyist. He suggested that the members, during 1949, keep a close eye on their state legislatures as all the states, except four, will have legislatures in session.

Appoint Traffic Committee

GEORGE A. THORNTON presided at the Thursday morning session. WM. W. COLLINS, JR., Counsel for the Association, discussed "Current Traffic Problems of the Industrial Sand Industry." The outgrowth of this paper was a motion by A. Y. Gregory to have the incoming association president appoint a Traffic Committee to look into the whole structure, and to confer with other related industries. This motion was passed. He indicated that the sand industry was not entirely satisfied with railroad treatment and that there were many points of difference, many of which were as confusing to the railroad officials as they were to the sand industry. The Traffic Committee is to look into these subjects, and others, and was given broad powers.

Industrial Hygiene Developments

THEODORE F. HATCH, Industrial Hygiene Foundation, discussed "Developments in the Field of Industrial Hygiene." He pointed out that the

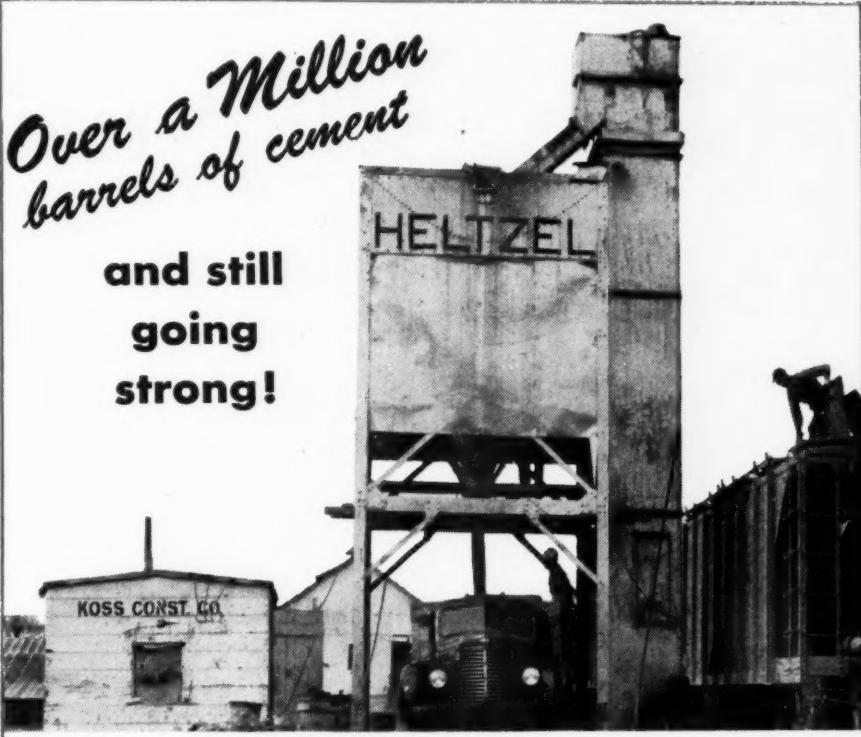
importance of particle size has not been established and that the finer sizes (less than one micron) were becoming more important. He cited various examples to confirm this opinion. Flocculation of particles may prevent dust from becoming hazardous. He mentioned that car loading dust was more flocculated than fresh dust from crushing and grinding. He discussed code developments, pointing out that states are becoming more liberal every year. He said the writing of a good code was not easy and it must be practicable to apply.

Secretary's Report

Sterling N. Farmer presided at the final Friday morning session. Executive Secretary, Vince Ahearn, opened the day's meeting with his report giving the hearers an interesting and concise report on conditions and of things that may develop from Washington during the next year or so. Mr. Ahearn voiced the opinion that he was sorry that the Traffic Committee was not formed years ago to confer with railroad officials. He expressed the belief that during 1949 the Social Security Act may be extended to all groups who work, whether for self, or for others, and this will mean an extension of rates and the revisions may include medical and hospitalization clauses. He thought that the trend of the times was to remove the cause of occupational diseases. Before long he expected allocation of steel, oil rationing and possibly coal rationing. He called attention to the effect that the Marshall Plan could have on their industry because the spending of many billions of dollars for recovery means that material will be shipped abroad—not actual dollars—thus accenting the present shortages. He believed the draft and not universal military training was on the books, and the draft even would take enough of the young men to give us a labor shortage crisis of unknown proportions, pointing out that at the start of World War II we had a huge unemployed labor reserve pool from which to draw, but now we have no cushion to lessen the impact of labor absorption through military requirements. He thought that the temper of the people was such that if strikes develop severe labor laws will be enacted. He believed there would soon be allocation of metals and inventory controls and advised all hearers to get their plants in first class shape NOW, and to have justifiable inventories of repair and other supplies on hand. He advised against building up unjustifiable inventories. He felt that wage and price controls were on the agenda.

On the political scene, Mr. Ahearn pointed out that the Civil Rights question was a political football and by-products of it will be more controls. He mentioned that the cement case was not a test of an old law but essentially was a new law.

(Continued on page 102)



VETERAN HELTZEL PLANT HAS REPAYED ITS COST 42 TIMES OVER IN 17 YEARS . . .

• 1,160,500 barrels of cement have been unloaded by this plant. In 1931, time studies indicated the plant cost would be repaid at the handling of 25,000 to 30,000 barrels. (Note comments by Mr. Koss in the following letter.)

*KOSS CONSTRUCTION CO.
General Contractors Since 1914
April 21, 1948*

Mr. Donald T. Helzel
Hetzell Steel Form and Iron Co.,
Warren, Ohio

Dear Sir:

Our records indicate this bin was purchased by us in 1931. It has been used by us on paving projects all over the middle-west from that time until the present and is still a good plant and doing a fine job. During this period, we have unloaded 1,160,500 barrels of cement with the Hetzel, including box cars, hopper bottoms and truck delivery. You can be justifiably proud of the performance of this equipment.

Yours very truly,
Richard B. Koss
Vice President



PORTABLE AGGREGATE BINS



CONCRETE PRODUCT AND CENTRAL MIX PLANTS



BULK CEMENT PLANTS



TRANSIT MIX FRAMES



CONCRETE BUCKETS

Hetzell plants are products of specialized engineering, and constructed for lasting, trouble-free service. Your requirements for plants will be served best by Hetzel. Write for information and literature.

HELTZEL STEEL FORM & IRON CO.
WARREN, OHIO • U. S. A.

See for Yourself...you will find WISCONSIN Air-Cooled ENGINES S - P - R - E - A - D O - U - T All Over the ROAD SHOW!



Officially, you will find the complete line of Wisconsin Air-Cooled Engines exhibited in Booth 1017, in the Main Exhibition Hall at the American Road Show, July 16 to 24 . . . and you will receive a most cordial welcome there. Pay us a visit by all means!

Unofficially, however, Wisconsin Air-Cooled Engines will be very much in evidence as standard power equipment on a great variety of road and construction equipment exhibited by other manufacturers, spread out all over the extensive Road Show grounds.

Leading manufacturers of heavy-duty machinery, calling for rugged, dependable power, appreciate the on-the-job service value of "Most H. P. Hours" . . . as delivered by Wisconsin Engines.



WISCONSIN MOTOR CORPORATION

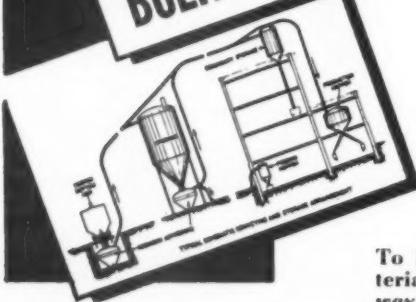
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 14, WISCONSIN

THE
Economical Way
TO HANDLE

BULK Cement

BULK Agricultural Limestone

BULK Fine Aggregate (dry)



Layout for conveying mate-
rial from plant to car or
truck would be similar.

ROBINSON Air-Activated CONVEYOR

From Crusher to Storage, from Storage to Car . . . it's here that the Robinson Air-Activated Conveyor will save you money in handling. Why?

- The Robinson System utilizes dry, low-volume air.
- It eliminates encrustation in conveyor lines which often happens in other pneumatic systems; moisture in low-volume air is readily controlled.
- There are no continuously moving parts, screw-feeds, bearings, or other parts which cause high maintenance or replacement costs.

To handle dry-pulverized or fine-granular materials in bulk pneumatically is the economical way; to handle them by the Robinson System is probably the most economical way. Our engineers will be glad to draw up Robinson plans and cost estimates for your requirements.

ROBINSON

Representatives in Principal Cities

Air-Activated

Division of
MORSE BOULGER DESTRUCTOR CO.

CONVEYOR SYSTEMS

211-H EAST 42nd STREET • NEW YORK 17, N. Y.

Car Supply

(Continued from page 101)

In the absence of W. C. KENDALL, Car Service Division of the Association of American Railroads, R. E. CLARK, manager, closed car section of the same group talked on the "Outlook for Railroad Transportation Facilities." He said the supply of gondolas was the most unsatisfactory of any group of cars and that hopper cars were a little better. The demand for covered hoppers is increasing. The silica industry uses some of this type and grain shippers are finding they are ideal; however, none are in the grain service at this time. He said that up to May 1 car loadings were off about 7 per cent compared to a year ago. He said that the weather history during the past 12 months as far as railroads were concerned was the worst in 30 years and this had lessened their efficiency somewhat.

During the discussion it developed that covered hoppers cost from \$4200 to \$4600 with box cars costing in the \$4000 range.

The speaker for this meeting was RAYMOND S. SMETHURST, counsel, National Association of Manufacturers, who spoke on "Federal Labor Policy as Reflected in the Taft-Hartley Act." He pointed out that so far there were no dire consequences from the passage of that act and that the law was weak in that a strike actually had to take place before the government could end it.

Owing to rains the plans for a picnic at the Cascades had to be abandoned. The ladies of the association were driven to the Greenbrier Hotel, White Sulphur Springs, Va., and inspected the new hotel there. During the afternoon the guests enjoyed the golf tournaments provided for both the men and ladies.

Mobile Phone Service

THE WARNER Co., Philadelphia, Penn., producer of ready mixed concrete, aggregates, and lime, has installed radio telephones in three automobiles operated by the company's Street Men, for supervising truck operations between where the concrete orders originate to where the concrete is being poured.

Providing quick communication between these two points, the radio telephone system enables the Warner Street Men to notify the Order Department at once should a job be held up unexpectedly or should there be a sudden change in delivery schedules, thus saving trucks from making needless trips through crowded city streets.

Operate Ilmenite Mine

THE duPONT Co. has announced plans to mine ilmenite at its properties at Camp Blanding, near Starke, Fla. Humphreys Gold Corporation, Denver, Colo., will handle the mining operations. The duPont company has leased 4000 acres at the wartime training camp.

Labor Relations

(Continued from page 53)

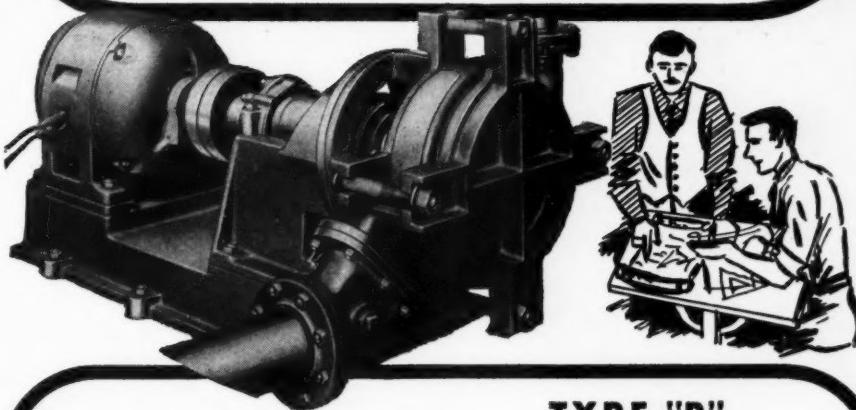
pensation is then divided by the number of hours actually worked during the same normal, non-overtime work week (additional overtime work if any, being excluded in making such computation). The overtime work in that week is then to be paid for at one and one-half times this regular rate so computed. Applying that rule to the present case the appellant has been fully paid. The amount of the production savings available for distribution in any one month was allocated under the plan, part to straight time employment and part to overtime employment.

"The part allocated to and paid for straight-time employment was added to the wages received through the contract hourly rate for the non-overtime work week, and this total amount used in determining the regular hourly rate for that week. Overtime work in that same week was paid for at one and one-half times this rate, using in part for that purpose that part of the production savings allocated under the plan to overtime employment. Appellant's error consists in attempting to treat all the production savings as being paid for regular non-overtime work, although the plan, by contract, provides otherwise. There is nothing in the F.L.S.A. which prohibits such an allocation. There is nothing in the Act which requires profit sharing in any manner or to any extent. If the appellee's [employer's] plan had distributed only a half, or a third or less, of the production savings, instead of all of it, and allocated the distribution entirely to straight-time work, it would not have been objectionable. It would have increased the 'regular rate' of pay with a resulting increased obligation for overtime. This increased obligation for overtime could have been paid out of the other half or two-thirds of the production savings which it did not distribute. Allocating such a portion of it to the employer's overtime obligation rather than merely withholding it, reached the same result."

Here then is a fair profit-sharing scheme, adaptable to almost any kind of a production enterprise, which apparently will pass the test of the courts. The only sour note is that after treating its employees so generously as did this employer, there should be any one so mean as to bring suit. By doing so, and putting the employer to the expense of fighting it through the courts, this employee certainly reduced the amount in the Production Savings Plan which would otherwise have been distributed for the benefit of all the workers. It is to be hoped that the experience hasn't soured the employer to the extent of abandoning the plan entirely.

LATROBE CONSTRUCTION Co. has started quarry operations at Latrobe, Penn., B. Ferrari, president, announced.

Men in YOUR field helped us build it



TYPE "R"

MORRIS SLURRY PUMPS

- Handles heavy cement slurry for longer continuous service with less maintenance and fewer replacements

A few years ago we combined our experience of 80 years with yours gained mainly in the field. We solicited your suggestions and recommendations . . . made extensive practical tests . . . and then designed the Type R Slurry Pump to meet your specific slurry-handling needs.

Now ONLY the Morris Type R has these FOUR outstanding features

1. Impeller and renewable shaft sleeve are removable without disturbing the piping. You simply loosen four outside clamping bolts and take off the end cover. This feature alone saves considerable time and labor.
2. Since the gland is under suction pressure only, the packing is subject only to suction or positive head pressures. This reduces leakage and dilution . . . keeps harsh abrasives out of the stuffing box . . . practically eliminates packing troubles.
3. The simple design of the Type R does not use internal studs or bolts. The suction disc liner is clamped into place between the disc and the shell. Shoulder fit to the suction disc insures perfect alignment.
4. Shell is interchangeable for right or left hand rotation. The suction and discharge nozzles can be rotated around the axis of pump to a total of 72 different locations.

Free Service

Morris Engineers will be glad to recommend the pump best suited to your needs for size, capacity, etc. Send us necessary data today.

MORRIS MACHINE WORKS, Baldwinsville, N.Y.
Sales Offices in Principal Cities

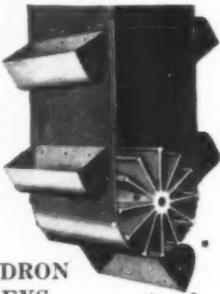
MORRIS Centrifugal Pumps



We invite Your Inquiries
MADE ONLY BY
A. LESCHEN & SONS ROPE CO.
ESTABLISHED 1857
5909 Kennerly Ave., St. Louis 12, Mo.
New York • Chicago • Denver
San Francisco • Portland • Seattle

BELT LIFE

INCREASED
50 to 400%
WITH
SPROUT-WALDRON
WING PULLEYS



In handling any material on conveyors, almost always some of the material is carried between the face of the pulley and the pulley side of the belt. The wings of the Sprout-Waldron Belt Saver Pulley eliminate the grinding or crushing action common with conventional type pulleys, and the life of the belt is greatly extended.

Handling sticky materials presents a problem as they tend to build up on the solid face of the conventional type pulley. The design of the Belt Saver Pulley prevents this condition. No wonder Sprout-Waldron Belt Saver Pulleys are a "must" on the tail end of any belt conveyor or on the boot of any bucket and for the handling of sticky materials.

Write today for catalog, listing available sizes.

SPROUT-WALDRON & CO.
Manufacturing Engineers
MUNCY PENNSYLVANIA

Manufacturers' News

Stearns Manufacturing Co., Inc., Adrian, Mich., has announced the appointment of Myron Hultmark as president. He succeeds Gene Olsen who will remain with the company for a few weeks to acquaint Mr. Hultmark with the work of the company. Mr. Olsen also will be available for consultation in the future.

Euclid Road Machinery Co., Cleveland, Ohio, has appointed D. R. Anderson as manager of the Hibbing, Minn., office. He will be succeeded as service manager in Cleveland, Ohio,



J. M. Fairbanks



D. R. Anderson

by J. M. Fairbanks, who has been general foreman of the St. Clair assembly plant. A native of northern Michigan, Mr. Anderson became associated with the company in 1935 and has been service manager for the past eight years. Mr. Fairbanks started in the structural department over ten years ago. Prior to serving in the Navy, Mr. Fairbanks was methods engineer. Upon his return he became plant engineer and in 1947 was promoted to general foreman at St. Clair.

Chase Bag Co., Chicago, Ill., announces the appointment of R. R. Koch as manager of the new Los Angeles plant. He was formerly sales manager of the Portland, Oregon, Branch. Mr. Koch has a thorough knowledge of the bag business, having joined the Chase sales staff shortly after his graduation from Washington University in 1923.

Harrington & King Perforating Co., Chicago, Ill., has announced the retirement of J. M. Fuller as president after 62 years of service with the company. Foye P. Hutchinson has been elected president; Judson E. Fuller, vice-president and treasurer; and S. Harrington, Jr., secretary.

Worthington Pump & Machinery Corp., Export Department, Harrison, N. J., has appointed Henry H. Ritchotte as Canadian regional manager to supervise sale of construction equipment in Canada. He will have his headquarters in Toronto.

Elwell-Parker Electric Co., Cleveland, Ohio, announces the appointment of James W. Lafferty as technical sales engineer in the Los Angeles office of Ira G. Perin Co., San Francisco, Calif., distributor for Elwell-Parker equipment.

Bailey Meter Co., Cleveland, Ohio, has opened a new branch office in Charlotte, N. C., with J. R. Powell as manager, assisted by R. T. Cathey.

Bemis Bro. Bag Co., St. Louis, Mo., announces that C. W. Akin, sales manager of the Bemis Paper Bag Co. plant at St. Helens, Ore., has been transferred to the St. Louis general sales office, where he will coordinate multiwall paper bag sales throughout the company.

Lincoln Electric Co., Cleveland, Ohio, has announced the election of W. R. Persons, general sales manager, and K. F. Steingass, superintendent electrode manufacture, as members of the board of directors.

Cummins Engine Co., Inc., Columbus, Ind., announces that Carl R. Fox, recently elected to the board of directors, continues to hold the positions of vice-president and works manager, in case the previous announcement in the June issue may be misconstrued.

Georgia Iron Works Co., Augusta, Ga., is the name of the reorganized Georgia Iron Works, Inc., which has been sold and a corporation formed under the new name. Officers and directors are Thomas W. Hagler, president; P. Virgil Hollingsworth, Jr., chairman of the board; J. Carroll Hagler, Jr., first vice-president; and George C. Baid, second vice-president.

Salsbury Corp., Los Angeles, Calif., announces that through a recent Federal Court decision, the manufacturing and sales rights on Salsbury turret trucks have been returned to the original owners, Salsbury Corp. These rights were formerly in the possession of Salsbury Motors, Inc., Pomona, Calif., until recently a subsidiary of Northrop Aircraft, Inc.

Allis - Chalmers Mfg. Co., Milwaukee, Wis., has elected Walter Geist to his seventh term as president of the company. All directors and officers were reelected. Officers are Walter Geist, president; W. A. Roberts, executive vice-president in charge of the tractor division; W. C. Johnson, executive vice-president in charge of the general machinery division; J. A. Keogh, vice-president and comptroller; H. W. Story, vice-president and general attorney; W. E. Hawkinson, secretary and treasurer; E. H. Brown, vice-president in charge of engineering development; Marshal L. Noel, vice-president and general sales manager for the tractor division; and J. L. Singleton, vice-president and director of sales for the general machinery division.

St. Regis Sales Corp., New York, N. Y., subsidiary of St. Regis Paper Co., announces the retirement of Ambrose T. Plunkett, vice-president, after 33 years of service with St. Regis and its subsidiary, the Taggart Corp.

Farrel-Birmingham Co., Inc., Ansonia, Conn., and Buffalo, N. Y., has appointed Paul R. Oliver as West Coast manager, with headquarters in Los Angeles, Calif.

Davey Compressor Co., Kent, Ohio, has appointed the Evans Machine & Equipment Co., Philadelphia, Penn., to a class "A" dealership covering on an exclusive basis the counties of Chester, Montgomery, Bucks, Dela-

ware and Philadelphia, Penn., and counties of Burlington, Ocean, Camden, Gloucester, Atlantic, Salem, Cumberland, Cape May, New Jersey.

Marion Power Shovel Co., Marion, Ohio, has appointed John K. Dolan as sales representative in the Chicago district covering northern and central Illinois, southern Wisconsin, eastern and central Iowa and southwestern Michigan. D. A. Riser is district manager.

LaPlant-Cheate Mfg. Co., Inc., Cedar Rapids, Iowa, has announced the appointment of Harvey W. Rockwell as chief engineer. He has been with the company since 1937, serving as assistant chief engineer, chief engineer of the Hydraulic Division, and chief engineer in charge of all development and patent activities.

Detroit Diesel Engine Division, General Motors Corp., Detroit, Mich., announces that Bemiss Equipment Corp., Richmond, Va., has opened a new sales and service plant, of which S. Merrill (Chick) Bemiss is president and founder. Guests at the opening included the honorable William M. Tuck, Governor of Virginia, and top ranking professional and political personages.

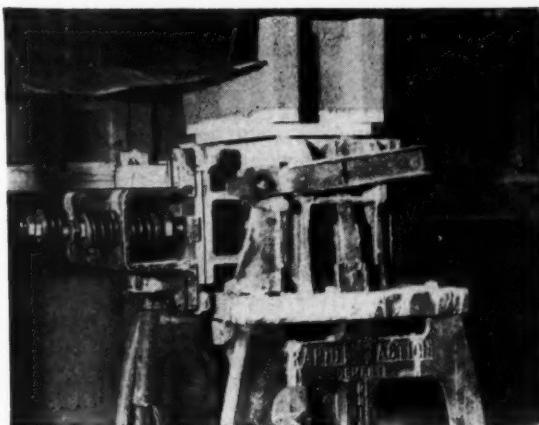
Detroit Diesel Engine Div., General Motors Corp., Detroit, Mich., has announced that the West Coast Engine & Equipment Co., Berkeley, Calif., headed by Muirson C. Wright, James R. Williams and Eugene C. Rhea, has opened a new sales and service plant on Ashby Avenue near the eastern terminal of the San Francisco Bay bridge.

Tutt-Bryant group of Companies, Australian distributors for a wide range of construction equipment throughout Australia, announces that Leo E. Tutt, chairman of directors, is visiting in the United States following a tour of England, Switzerland, Belgium, Denmark, Sweden and Norway. Among the many companies represented by this group is the Wisconsin Motor Corp. Mr. Tutt founded this business ten years ago. He is also a director of LeTourneau (Aust.) Pty. Ltd.

Allis - Chalmers Mfg. Co., Milwaukee, Wis., announces that William J. Faulkner has resigned as industrial sales manager of the tractor division to become vice-president and part owner of Frantz Tractor Co., Allis-Chalmers' New York dealer.

Leeds & Northrup Co., Philadelphia, Penn., announces that Felix Wunsch, engineer and inventor, and Paul V. Roth, shop engineer, have retired after many years of service. Mr. Wunsch has spent nearly 43 years with the company, starting in 1905 in the laboratory making electrical instruments. Mr. Roth has been with Leeds & Northrup for nearly 46 years, starting in 1902 as head of one of the shop divisions.

H. K. Porter Co., Inc., Pittsburgh, Penn., has announced the appointment of Lawrence A. Franks as manager of the Boston district office.



**NOW YOU
CAN ADD**

"Vibration"

To Your Hand or Power Block Machine

with

SYNTRON

"Pulsating Magnet"

ELECTRIC VIBRATORS

3600 powerful, pulsating vibrations per minute will produce a denser, stronger block and improve its appearance.

Applied to either the mold box or the pallet depending upon the design of the machine.

The illustrations show a Model V-75 mounted on a hand machine — and a Model V-500 on a power machine.

**Investigate their advantages,
write to**

SYNTRON CO.

450 Lexington Homer City, Pa.

UNIVERSAL means ECONOMY!

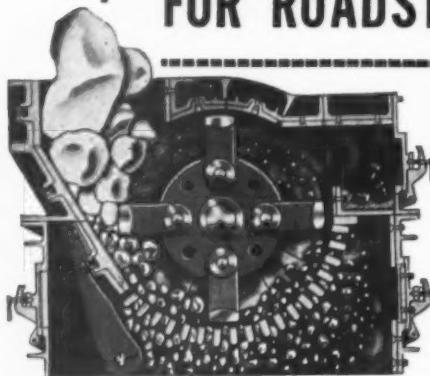
- 1 • reasonably priced**
• lower maintenance costs
- 2 Yet UNIVERSAL design provides higher productive efficiency in sizing the most difficult aggregates.**
- 3 A wide range of UNIVERSAL models can answer your particular problem.**
- 4 Write today for Catalog No. 107 on Screens and Screening.**



Type
"Mr"
42"x96"
Double
Deck

UNIVERSAL VIBRATING SCREEN CO.
RACINE - WISCONSIN

THE IDEAL CRUSHER FOR ROADSTONE MARKETING



Cross-Section view of American "ACS" Type Hammermill. Note special construction features: Front feed shortens travel of stone in hammer circle, produces minimum fines and a coarser product. Grinder and breaker plates are easily accessible for quick change of product size and to compensate for wear. Built-in trap in upper right corner collects tramp metal.

the AMERICAN FRONT FEED ACS CRUSHER

American ACS Front Feed Crushers are built for high capacity, heavy duty production, with individual size control and easy external adjustments that assure:

- Uniform, cubical runs of desired roadstone, aggregate and base sizes.
- No fingerstones or slivers.

Available with any of three hammer types. American ACS Hammermills are engineered for efficient, rapid crushing of any hardness of stone. Capacities up to 250 TPH.

Write for bulletin: "Better Stone Crushing."

American PULVERIZER COMPANY
Originators and Manufacturers of
Ring Crushers and Pulverizers 1245 MACKLIND AVE.
ST. LOUIS 10, MO.

*Save Power and Labor On
Your Long Haul Digging*



This Sauerman Smekline Cableway digs gravel from lake and keeps screening plant supplied with 75 tons an hour at low cost.



Sauerman Scraper moves material from wide pit to crusher.

SAUERMAN CABLEWAYS and SCRAPERS

You can dig and haul from pit, bank, river or pond, strip overburden, or store and reclaim loose materials at lowest cost with a SAUERMAN Machine. Use a Scraper for handling dry material—a Cableway for under-water digging. Either machine will range rapidly over a wide area, digging, hauling and dumping in one operation. Requires only one man at the controls and power consumption is remarkably small, whether electric, gasoline or Diesel. Installation cost is low and maintenance simple.

Let us recommend the right type of machine for your work. Send for our illustrated Catalog and tell us about your own problems.

SAUERMAN BROS. Inc.
530 So. Clinton St. Chicago 7, Ill.

The Shovel Co., Cleveland, Ohio, announces that 165 service engineers from 40 states and three foreign countries have attended the Distributors Service School at the Lorain, Ohio, plant. The purpose of the school is to provide the best possible field service for Lorain users, and to make factory trained service personnel available to them. The course is two weeks long, involving a thorough study of power crane and shovel engineering, design, construction and service. Ralph Thibaut, of the service department, is chief instructor at the school.

Laclede-Christy Clay Products Co., St. Louis, Mo., announces that Julius A. Kayser, formerly assistant to the president, has been appointed resident vice-president and manager of Pacific Coast activities with offices in San Francisco, Calif. William E. Daugherty has been named district manager in Los Angeles; Russell K. Wasmann, district manager in San Francisco; and Walter Emes, superintendent of the West Coast plant at Warm Springs, Calif.

Marion Power Shovel Co., Marion, Ohio, has appointed H. Wilson Hubert as district sales representative in charge of the Pittsburg, Kans., office. He succeeds Ernest M. Peterson who is now superintendent of the Thorobred Coal Co. in Providence, Ky. A. William McGraw has been appointed representative in sections of Missouri, Illinois and Kentucky, and Mervyn W. Martin has been appointed sales representative in California and Nevada. For the last two years, Mr. Martin has been manager of the shovel and crane division of Shaw Sales & Service Co., Los Angeles, distributor for Marion Power Shovel Co. Mr. Martin and Edward R. Daley, district manager, will work out of the San Francisco office.

Raybestos-Manhattan, Inc., Manhattan Rubber Division, Passaic, N. J., recently honored 56 new 25-year employees as Manhattan Pioneers at a dinner which was attended by nearly 600 Pioneers and their wives or husbands. John F. D. Rohrbach, newly elected president, was the speaker.

Ford Motor Co., Dearborn, Mich., has announced the appointment of George M. Catchpole as assistant manager of the fleet sales section. He was formerly Denver district truck and fleet manager, and has been with the company since 1935.

Raybestos - Manhattan, Inc., New York, N. Y., has appointed Jerome W. Brush, Jr., as assistant director of marketing and merchandising, a newly created department. David E. Cunningham succeeds Mr. Brush as marketing supervisor.

Nordberg Mfg. Co., Milwaukee, Wis., has appointed G. B. Wright as sales engineer in the small engine department of the heavy machinery division.

Noble Co., Oakland, Calif., has announced the appointment of L. M. "Les" Horton as factory representative.

CONCRETE PRODUCTS

CONCRETE UNITS . READY-MIXED CONCRETE



South Texas Materials Co., plant No. 2, Corpus Christi, Texas, supplies large volume of concrete for industrial plants

A SECTION OF
ROCK PRODUCTS

DURAPLASTIC improves machine-made concrete products



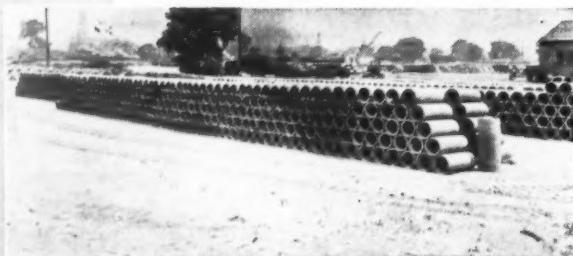
Atlas Duraplastic makes a mix that feeds easily through machines with less breakage. That's because Atlas Duraplastic permits the use of slightly more mixing water. This provides a damper, more cohesive mix that holds together better without slumping or distortion of the green products. Finished units are more compact, with lower water absorption and greater resistance to passage of water.

generally improves appearance



Even when harsh aggregates are used, products made with Atlas Duraplastic show improved appearance and better surface texture. Corners and edges are cleaner; dimensions truer.

at no added expense



No unusual changes in manufacturing methods are necessary and no additional expenses are incurred when using Atlas Duraplastic Cement. Plants report savings in fewer culs and throwbacks and less breakage in handling green products.

OFFICES: Albany, Birmingham, Boston, Chicago, Cleveland, Dayton, Des Moines, Duluth, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.

Atlas Duraplastic complies with ASTM and Federal specifications and sells at the same price as regular cement. Write for further information. Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

ATLAS DURAPLASTIC AIR-ENTRAINING PORTLAND CEMENT

MAKES SUPERIOR CONCRETE PRODUCTS AT NO EXTRA COST

TRADE MARK REG.
U. S. C. CO.



"THE THEATRE GUILD ON THE AIR"—Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—September to June—ABC Network

INDUSTRY NEWS

Northwest Concrete Products Manufacturers

AN ALL-DAY GATHERING of the Associated Concrete Products Manufacturers, Inc., of the Pacific Northwest was held recently at Portland, Ore. President Carl Smithwick opened the morning business session at which time trustees were elected.

In the afternoon, the following speakers were heard: William MacKenzie, Portland, on "New Methods in Manufacture"; Lloyd Williamson, Bend, on "Quality Pumice and Quality Blocks"; Phil Brady, Portland, on "Labor Management Co-operation"; Robert Weiner, regional director, N.L.R.B., on "Operating Under the Taft-Hartley Act"; and Frank Pennypacker, Portland, on "Interesting Historical Highlights in Aggregate Production."

The program was concluded with a dinner at which Frank N. Belgrano, Jr., president of the First National Bank, discussed "Looking Ahead."

Purchase Office Building

MASON CITY BRICK AND TILE CO., Mason City, Iowa, has purchased the eight-story Foresters building in Mason City where new offices will be established, M. D. Judd, executive vice-president, announced.

Tilt-Up Film

THE PORTLAND CEMENT ASSOCIATION recently presented a film on tilt-up construction to residents of Bethany, Mo., interested in building a country clubhouse on the city lake tract. It is planned to use this type of construction for the new building.

"Mike" Loving Moves Office

M. W. LOVING, who is widely known throughout the concrete products industry, particularly among concrete pipe manufacturers, and in the cement industry, has moved his office from Chicago to Glenview, Ill., P. O.

Box 295, phone Glenview 1160. Mr. Loving has been engaged in consulting engineering practice for several years, and will be also remembered as secretary of the American Concrete Pipe Association.

Seek Bids for Concrete Aggregate

AN INVITATION for bids to furnish 1,320,000 tons of concrete aggregate for McNary Dam has been made by the Department of the Army, Corps of Engineers.

Concrete Block Sandbox

LEFT-OVER CONCRETE BLOCKS, when joined in square formation by steel U-bars, make fine permanent sandboxes for youngsters. If U-bars are unavailable, stakes driven into the ground through holes in the blocks will hold them in place.

QUEEN CITY CONCRETE PIPE CO., INC., Cincinnati, Ohio, has been organized and plans to start operations in a short time. Capital is listed at 250 shares of no par value stock. Fredricks D. Berger, Naomi B. Pleimann and Ruth R. Biehl are the principals.

RALSTON COAL AND SUPPLY CO., Marion, Ohio, has opened a concrete block plant with a capacity of 2000 to 3000 standard 8- x 8- x 16-in. block per day. Cinder block will be produced later. Elton J. Ralston and James H. Ralston, brothers, own and operate the plant.

TALMAGE CONCRETE PRODUCTS CO., Auburn, Neb., has begun production of concrete block on its 1948 program. In its first year and a half of operations, the concern turned out over 200,000 block.

WILLIAM E. SHEPHERD and son, Gordon, have opened a concrete block plant at Colfax, Wis., equipped to manufacture both 8- and 10-in. block.



Two sides of Mike Loving's new office, showing some of his hunting trophies

CHARLES BOSELL, Chicago, Ill., has purchased the building and equipment of the Anna Block Co., Anna, Ill., from C. C. Penninger and Guy Gamber of Anna. Jack Gore, formerly with a concrete block plant at Cypress, Ill., will be manager of the Anna plant.

DORA-CRETE PRODUCTS, INC., Hillsboro, Ill., has been granted a charter by the secretary of state at Illinois to produce, purchase and use construction materials. Capitalization is set at 90 shares of common stock, par value \$20. E. G. Hurst, R. P. Keele and A. P. Rosche are the principals.

LAND CONSTRUCTION CO., St. Joseph, Mo., has established a branch ready-mixed concrete plant in Atchison, Kan., to deliver concrete to surrounding rural areas. Gus Hilliz, Jr., has been appointed branch manager.

READY MIX CONCRETE CO., Detroit Lakes, Minn., has started the manufacture and merchandising of ready mixed concrete. Equipment includes two truck mixers, a 75-ton compartment bin, and warehouse. Ray Hendrickson, G. M. Nass and V. J. Wagner own and operate the new firm.

RUSH RIVER SAND AND GRAVEL CO., Red Wing, Minn., owned by Victor Gilbertson and William Nelson, has started construction of a concrete block plant near Ellsworth village.

STERLING CONCRETE CO. is constructing a ready-mixed concrete plant at Bismarck, N. D., with John W. Larson and son, John W. Larson, Jr., as proprietors. The plant consists of a high-capacity concrete mixer mounted on a high wooden platform, which is loaded with sand, gravel and cement by mechanical devices. Plant capacity is rated at over 100 cu. yd. per day.

DONALD SCHUTT AND ARTHUR BARBER, JR., have announced plans to open a ready-mix concrete plant at Granite Falls, Minn., to be known as the Granite Falls Construction Co. Mr. Schutt will be plant manager, and Mr. Barber will be secretary of the company.

LOCH SAND CO., Maryville, Mo., owned and operated by Claude Loch and son, Robert, has expanded facilities to include the production of ready mixed concrete. Two new transit mixer trucks have been purchased, plus a Heltzel bin with a 2-cu. yd. weigh-batcher and 10,000 lb. scale.

GENEVA BLOCK AND SUPPLY CO., Geneva, Ohio, has started production of a concrete block, stained with a series of solutions to resemble stone. Block will never discolor, according to Jacob J. Tellen, manager. No paints are used in the three solutions used, one of which is iron rust, and the second of which is natural coloring taken from stone.

PRESNELL BROS. have established a ready mixed concrete plant at Pala, Ill.

CARL DAVISON has started the production of concrete block at Lakin, Kan.



BESSER Super VIBRAPAC

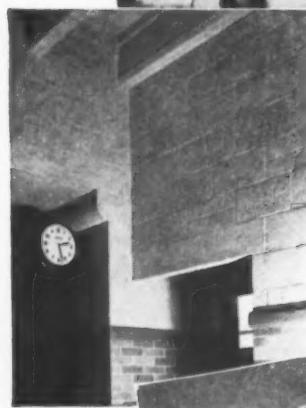
Concrete Block Machine

BESSER VIBRAPACS Now Operate in the
Following Territories and Countries:

AFRICA
ALASKA
ARGENTINA
CANADA
CZECHOSLOVAKIA
DOMINICAN REPUBLIC
ENGLAND
FRANCE
HAWAIIAN ISLANDS
INDIA
ICELAND

IRELAND
MEXICO
PALESTINE
PANAMA
PHILIPPINE ISLANDS
PUERTO RICO
RUSSIA
UNITED STATES
VENEZUELA
YUGOSLAVIA

Write for names of resident foreign
Sales and Service Representatives.



Modern homes, hotels,
factories, farm houses
and public buildings
are built with Vibrapac
Concrete Masonry Units.

Vibrapac Block
can be made
in a variety of
attractive de-
signs . . . in
natural finish
or painted . . .
for exterior or
interior walls.



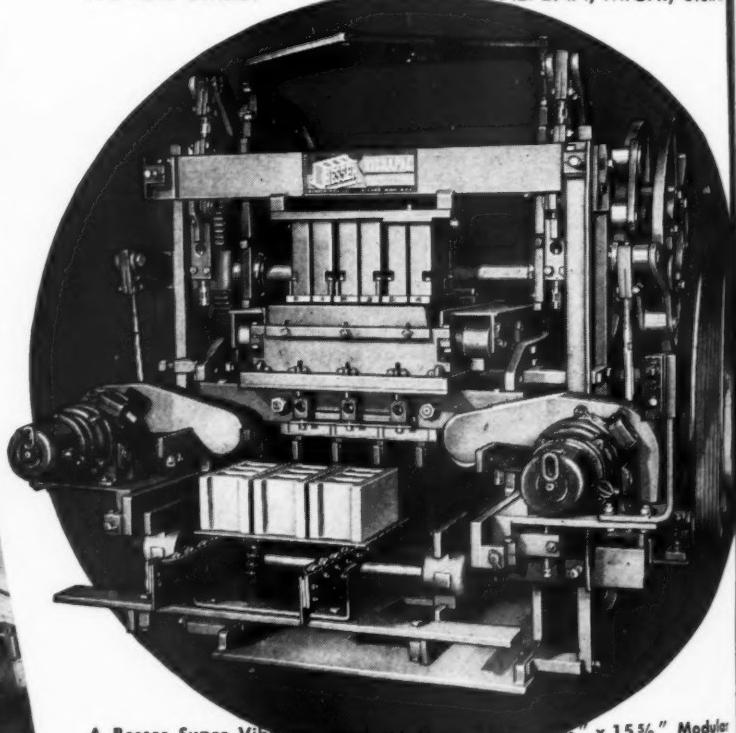
Concrete Masonry Units, produced with Besser Vibrapac machines, meet a world-wide demand for a versatile, durable and yet economical building material. With Vibrapac Block, any architect or builder can select or originate a design that will give a building that pleasing appearance and individuality that satisfies pride of ownership.

A Besser Vibrapac is fully automatic. No machine operator is required. One man off-bears total capacity of Vibrapac with no starting or stopping. It is a continuous operation.

If you intend to erect a new concrete products plant . . . or expand your present plant . . . consult a Besser engineer. He will gladly give you the benefit of his broad experience in this specialized field.

BESSER MANUFACTURING CO.

Complete Equipment for Concrete Products Plants
115 48th STREET
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A Besser Super Vibrapac produces up to 100 units per hour, 7" x 15 1/2" Modular units at a time on one Plain Pallet. Other sizes, in equivalent multiples, made on the same Plain Pallet. Also special sizes and shapes specified for today's building projects.



Practical CONCRETE RESEARCH

Developments in concrete pipe manufacturing in this country compared with progress abroad

By M. W. LOVING*

ABOUT everything we do these days is based on practical experience and this has also been the rule everywhere since the beginning of time. Yet it is also true that we learn new and better ways of doing things, and in the case of concrete pipe, there have been many new developments in recent years—especially outside the United States.

All or most of these developments are in the direction of manufacturing concrete pipe with concrete having compressive strengths ranging from 10,000 to 15,000 p.s.i., with corresponding low absorptions and maximum water-tightness, known technically as impermeability. All of these things are done with standard portland cement, known as Type I in this country, a good grade of sand and coarse aggregates of sound quality. Thorough mixing of the concrete is mandatory and of paramount importance; no admix of any kind is used in the concrete mixture. Curing with steam, water spray or a combination of both is followed to the letter, with no exceptions.

Yet the production costs are not high, with the latest methods, and in fact they are lower than some of the

methods and processes used in this country. This is because the manufacturers are not restricted by too much technical shadow-boxing on the part of the engineers or with specifications drawn to favor one or more producers of patented products and where equivalent alternates, based on sound engineering, are discouraged and restrict-



F. L. Fitzpatrick, general manager, Rocla Limited, Melbourne, Australia, who is on a visit to the United States

ed for reasons other than technical. You will, I believe, feel like I do—after you read this article and look at my pictures—that the future of GOOD concrete is really unlimited.

On June 3, 1948 here in Glenview, Ill., I had a 10-hour conference with F. L. Fitzpatrick, general manager, Rocla Limited, Melbourne, Australia, who very recently flew here from Sidney in 41 hours. His company has been engaged in the concrete pipe business in Australia since 1922, and is one of the two largest manufacturers of concrete pipe and other products in that country.

Our conversations were mostly on the technical and manufacturing aspects of reinforced concrete pipe of conventional design and prestressed. And because Mr. Fitzpatrick had only one set of pictures of his many operations and could not give me any, I will use pictures of my own, taken outside of the United States on May 19, 1948, to illustrate this article; also some I took in California on February 20, 1948.



Fig. 2: A cut-section from a 24-in. diameter, 22-ft. long prestressed reinforced concrete pipe. Look at this illustration with an enlarging glass for details

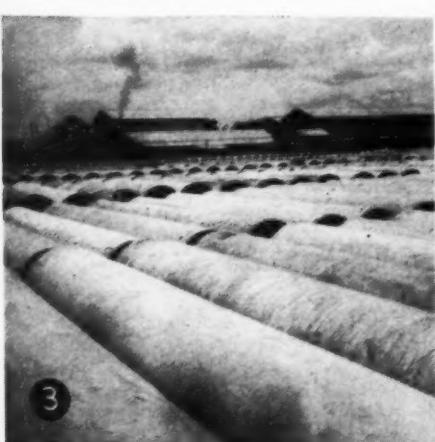
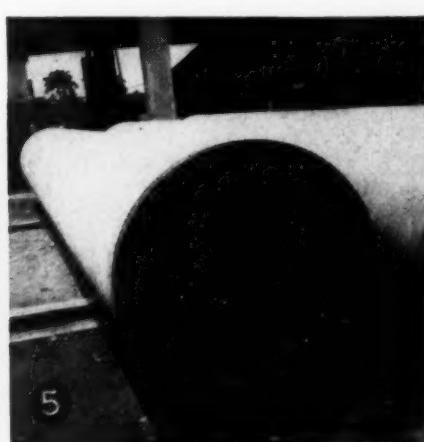
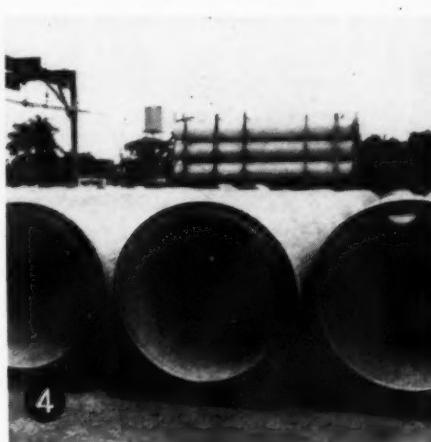


Fig. 3: View of storage yard, with part of the plant shown in the background. Complete absence of shrinkage cracks was evident in pipe which had been in storage more than six months. Fig. 4: Close-up view of some 30-in. pipe and the same pipe, loaded on a freight car, are shown in the background. Fig. 5: Another view of a 24-in. diameter prestressed reinforced concrete pipe made in 22-ft. lengths



CONCRETE PIPE

Prestressed Reinforced Concrete Pipe

These pictures show prestressed reinforced concrete pipe, without any steel cylinder, made in diameters of 24, 30 and 36 in. and in lengths of 22 ft., by two of the largest cast iron pipe manufacturers in the world—French and American. The shell thickness of the 24 in. core is only 1.5 in.; the 30 is 1.75 and the 36 in. diameter core is 1.9 in. thick. After winding with oil tempered spring steel wire, at 100,000 p.s.i. tensile stress, each large diameter pipe is given a concrete cover-coat about 0.75 in. thick. These pipe are designed for an internal working pressure of 150 p.s.i., and are tested with a full-size tester to 250 p.s.i., without any leakage through these thin concrete-steel shells; except damp spots may be on the external surfaces of the pipe, due to the elongation of the circumferential steel wire—below its yield point. But when the pressure drops to the working pressure, the concrete shells are as tight as a drum and then the concrete is not in compression. The concrete used has a compressive strength of around 13,000 p.s.i. Fig. 2 is a view of a cut-section of a 24-in. pipe, and shows how the pipe is made, without a steel cylinder. This prestressed reinforced concrete pipe is made with a concrete mixture of standard portland cement, Type I, ordinary sand and a fair grade of crushed limestone; no admix of any kind is used. Moreover, one American mechanical engineer and a French concrete engineer are in sole charge of operations. All the workmen and foremen are former construction men, without any prior experience in the concrete pipe business and they were trained from scratch by the two engineers mentioned and you must agree that they are doing a fine job. Needless to add, the plant and equipment is very elaborate and expensive and

this is not a venture for anyone with limited capital. In looking over the extensive stock of pipe in the storage yard, Fig. 3, I was unable to see any evidence of shrinkage and other small cracks inside or outside any of this pipe. This is because the concrete is in compression and when the pipe are in service and operating under the designed pressure, the concrete is then not in compression; this kind of pipe has been used for the construction of penstocks in France. A 63-in. diameter pipe line was installed for a power plant on the Selz river in the province of Garonne in 1946. The pipe were made in lengths of 6 meters (19.68 ft.) with a shell thickness of only 5 in. and they withstood a test pressure, without leakage, of 715 p.s.i. No steel cylinder was used.

Getting back to my conference with Mr. Fitzpatrick, or rather his disclosures to me of the many things they have done and are doing on a commercial basis with concrete and concrete pipe, I was really embarrassed at how little I knew about this business—which I have been identified with, in a modest way, in this country since 1916.

Australia Uses Centrifugal Method

Practically all the concrete pipe used in Australia is manufactured by the centrifugal process in lengths of 8 and 12 ft.; some of the smaller diameter pipe is made in shorter lengths. The pipe are used for drainage structures for highways and railroads, drainage systems, sewerage (for foul water, as they say in England) and especially for the construction of water supply lines and sewage force mains, operating under static heads up to 400 ft. You would be amazed to see a list of the many installations of 4, 6 and 8 in. diameter pressure lines in cities large and small on major projects; it is said that this pipe is made and sold for

about 50 per cent less than cast iron pipe.

In passing, it may interest you to know that the TATE PROCESS of "cement lining cast iron water pipe laterals in situ" was invented and perfected about 1932 by W. D. TATE, a member of the Water, Sewerage and Drainage Board of Sidney, Australia. The Tate process has been and is today extensively used by cities of this country for lining existing cast iron water lines, from 4 to 12 in. in diameter, with cement mortar—in place. According to an official report of Mr. Haskins, chief engineer, Water, Sewerage and Drainage Board of Sidney, the annual loss due to corrosion of unlined cast iron pipe in Sidney's water system exceeds one million dollars. The capital cost of the system is 40 million dollars, and there was in 1932-33 about 3000 miles of 4- and 6-in. diameter pipe in the lateral system. This report was sent me a number of years ago by an engineer in New Zealand, and it shows how extensive this corrosion problem is and how it is effectively prevented with a lining of cement mortar. The advantages of cement mortar for this purpose, were first discovered by the French Academy of Science in 1836 and cement lined cast iron and wrought iron water pipe have been used by cities of this country since 1845.

This cement lining aspect is mentioned here again, as I have often done before, in my articles in ROCK PRODUCTS, simply to emphasize the fact that the reinforced concrete pressure pipe business in this country or in any other country did not "just happen" but is the result of a series of developments over a period of more than a century. My article in ROCK PRODUCTS, February, 1948, details the development of reinforced concrete pressure pipe, first in France and later in the United States and Canada.



Fig. 6: Curing rooms, with Al Streblow's rabbit-trap type doors in the background and some 30-in. pipe in the foreground. Left over concrete is used to make fence posts. Fig. 7: Showing depressed track over which cores are transported to and from the curing rooms and to the storage yards. It rains here about every day and this area is also well drained. Fig. 8: Close-up of concrete cover-coat on a 30-in. pipe; this is the first example ever viewed by the writer where a concrete cover-coat was placed by machinery



CONCRETE PIPE

In my conversations with Mr. Fitzpatrick, he seemed surprised that many of the concrete pipe plants in this country were not staffed with technically trained men and with laboratories both physical and chemical; he showed me the pictures of his several departments and explained how valuable they were and what wonderful results they had obtained by following this course. I told him that many of our concrete pipe manufacturers had to spend too much time, especially since 1933, in filling out forms and other red tape for our bureaucracies.

Production Incentive Plan

In his organization, Roela Limited, they have a production incentive plan that works to the advantage of all members of the company, from workmen to management, including the laboratory men. Schedules of production are established and when and if they are exceeded, every member of the company profits; when production falls below the established levels the bonus is not forthcoming. In this way everybody is on his toes and all this is done without lowering, in any way, the quality of the concrete pipe and other products they make; quality products are made—day in and day out—with no exceptions for any reason.

U. S. Excels in Small Diameter Pipe

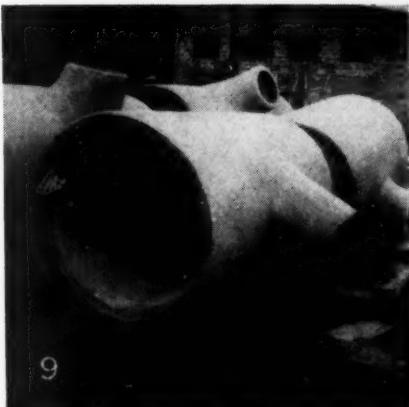
In the manufacture of the smaller diameter concrete sewer pipe on the packer-head and tamping machines, produced in this country, we still have the edge on the foreign manufacturers. For more than 30 years we have

been producing the smaller pipe in large quantities at a low production cost, and when care is exercised by the manufacturer, the quality of this small pipe is excellent. I told Mr. Fitzpatrick about it, and showed him pictures and test results of concrete sewer pipe made in Los Angeles, Calif., in 1926 with a shell thickness only $\frac{1}{8}$ -in. in thickness. Any joint of this 4-in. diameter pipe, made in 3-ft. lengths could be tested, without leakage, to more than 100 p.s.i. internal hydrostatic pressure. And all this accounts for the fact that several of our American concrete pipe machinery manufacturers have an extensive foreign business. The extensive use of concrete irrigation pipe in California for more than 60 years, and more than 30 thousand miles are in service today in California alone, and also in South Texas and other states where irrigation is practiced—this non-reinforced pipe has done a remarkable job.

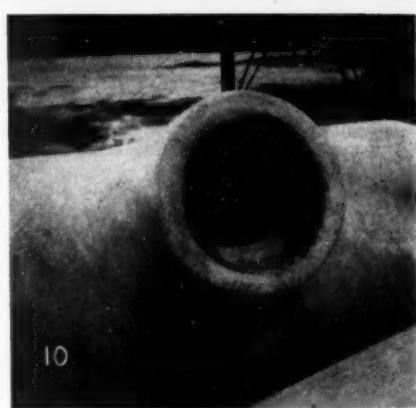
But the foreign manufacturers have the edge on us in the production and sale of centrifugal pipe, and very lately an entirely new method, because concrete mixtures with a water-cement ratio of 0.5 or less are utilized in the manufacture of the pipe in long lengths—in the horizontal position. There is no separation of the aggregate in the manufacture, as is so often seen in this country where plastic mixtures are still utilized in the manufacture of centrifugal concrete pipe. This, more than anything else, has accounted for the more or less limited use of the centrifugal process in this country except in California; the aggregate problem.

Mr. Fitzpatrick showed me cut-sec-

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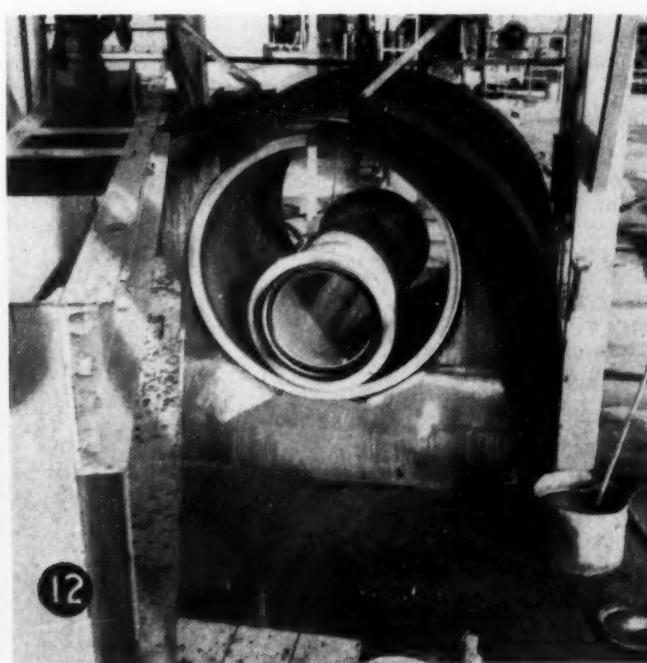
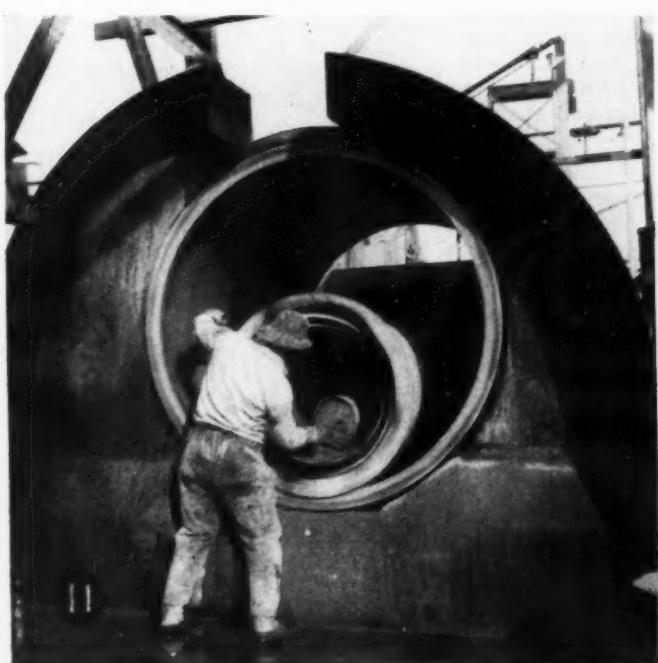


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Fig. 9: Did you ever see such excellent workmanship as this on specials? It is hand work by workmen who never saw or heard of concrete pressure pipe more than a year ago. Fig. 10: Close-up of the special shown in Fig. 9. Here can be seen the crazing cracks always found on steel pipe, covered with concrete when made and if exposed to sun light for a considerable period of time. When laid they close up by autogenous healing but they do not improve the appearance.



12

Fig. 11: Spinning 27-in. diameter, 8-ft. long centrifugal pipe at the plant of the Valley Concrete Pipe and Products Co., Yuba City, Calif., on February 20, 1948. The end of the Pumcrete charger is shown. Fig. 12: Mold is rolling at a rim-speed of about 3000 ft. per minute, and it usually takes about 20 min. to densify the concrete. Notice how clean the floor is at the end of the mold; the shield prevents the splattering of mortar and slurry.



Enclosed, 10-ton capacity, trailer truck body protects sacked products from the weather. The sides are attractively lettered with advertising

Producing Dry-Mix Concrete

**W. R. Bonsal Co., Inc., Hamlet, N. C.,
also has concrete floor and roof slab plant**

ONE of the most progressive companies in the Carolinas is the W. R. Bonsal Co., Inc., with main offices at Hamlet, N. C. This company has had a gravel operation near Lilesville since 1907. The president of the company, W. R. Bonsal, Jr., is also president of the Lawrence Stone & Gravel Co., with a concrete masonry manufacturing plant at Blenheim, S. C. A proposed new gravel plant to be built at Cheraw, S. C., is still in the drawing room stages, and it is expected that construction on that unit will go forward when building materials ease up a little.

Near the city limits of Lilesville, N. C., the company has just placed in operation a very neat and efficient plant for the production of Sakrete. The company has the license for five states; North and South Carolina, Virginia, Georgia and Alabama.

Sakrete is the name given an accurately proportioned dry mixed concrete of sand, gravel and portland cement. The mixed ingredients are sacked in multiwalled paper bags. Concrete resulting from Sakrete is designed to give 5000-lb. strengths. Sakrete is intended primarily for the occasional user of concrete who has a small job to do. By using this convenient material, all the user has to do is add the specified amount of water to the mix and a high grade concrete results. The company also prepares a Sand Mix and a Mortar Mix. The so-called Gravel Mix is sold in 90- and 45-lb. bags, the Sand Mix in 80-, 45- and 11-lb. bags, and the Mortar Mix in 80- and 45-lb. sacks.

To prepare this type of material the aggregates must be of good quality and bone dry. The sand and gravel is delivered to the plant by the company's trucks from the washing plant about a mile away. The damp aggregate is dumped to a bunker that serves a short bucket elevator. The elevator delivers to a 4- x 40-ft. rotary, oil-fired dryer. The dryer will handle 10 t.p.h. The dried aggregate is again elevated to a vibrating screen at the top of the plant where four sizes of material are made and sent to steel bins that have a total capacity of 100 tons. All the bins and elevator

and related equipment were made by the company and they did an excellent job of it.

The method of mixing the aggregate and portland cement is one developed by the Sakrete Co., and the details are secret. However, the system is entirely automatic and continuous and includes the use of small Tyler electric vibrator feeders, that blend an accurately proportioned material to the mixers after which the mix drops to the sack room below. Here Fairbanks-Morse precision indicators show the operator of the bagging machine the exact weight going into each sack, and this weighing operation is also automatic. After the sacks are filled they pass to a Union Specialties Co. sewing machine where the open-mouthed bags are neatly and quickly sewed shut. Two men at this machine can turn out slightly in excess of 1000 bags per shift. St. Regis and Arkell & Smith paper bags are used. Three- and four-walled bags are used with the 3-wall sacks for the smaller sized bags. The filled bags are stored on small wood pallets, and carload and truck shipments are made from the warehouse. A gasoline engine-driven Truckman lift truck is available for handling bagged portland cement which is also transported from this same packroom. The rheostat controls for the three electric vibrator feeders are mounted on a panel behind the sacking machines where all the Square D motor control switches are also mounted.

Aggressive Selling Program

For the area immediately contiguous to Lilesville the company ships its products in a new tractor-semi-trailer unit with an enclosed body that can handle 12½-tons if necessary but loads are kept at 10 tons. It is painted in appropriate colors and is a real advertisement of this plant's output.

Sale of the material is mainly through distributors contacted by two salesmen who travel the area. The

(Continued on page 127)



Rotary dryer for drying aggregates. Storage bunker to the rear is constructed with Flexicore concrete units

HIGH TEMPERATURE CURING

Crescent Concrete Products Corp., New Orleans, La., converting plant to high-temperature curing. Cubing system speeds up handling of block

By DAVID MOCINE

CONCRETE masonry plants "south of the Mason-Dixon line" need much less protection from Winter weather; and because of the warmer year-round temperature, have been slower than their northern counterparts to install high-temperature curing. The plant of Crescent Concrete Products Corp., New Orleans, La., is typical of progressive southern concrete masonry manufacturers.

With a Besser Super Vibrapac, plant capacity is 5000 modular block or 50,000 brick per one shift day. Both block and brick are made from the same aggregate: 70 per cent Superock, 30 per cent hard slag. The 50-cu. ft. Besser mixer has been moved to the floor level with a one-batch bin directly over it. The bin is charged by a $\frac{1}{4}$ -cu. yd. Scoopmobile from the yard stock piles. A full 10-min. mixing time has resulted in the production of a superior unit.

Block racks are moved from the machine to curing kilns and from kilns to covered space in the storage yard for cubing by a gasoline engine-powered Clark fork truck. Modular 8-x 8-x 16-in. block are placed 72 per cube, and 12-in. block are arranged 40 units per cube. Brick and 4-in. block are not cubed. A gasoline engine-powered Motolift fork truck is used to stack cubes, three high, in the paved storage yard. Results of several Pittsburgh Testing Laboratory tests show an average compressive strength of 3637 p.s.i. after 7 days for Superock-slag brick and 1044 p.s.i. for block with the same aggregate. Weight of modular 8-in. block averages 31.75 lb. and absorption equals 6 per cent.

Regular portland cement is used principally, but air-entraining cement is preferred when available.

Crescent Concrete Products Corp. formerly employed a low temperature, 24-hr. curing cycle, with a 15-hp. boiler generating 15 lb. steam pressure at the boiler. Heavy canvas was lowered over the single entrance-way to each of five kilns before the steam, entering the kiln through a single "T" nozzle, is turned on. This system has been replaced by a Cleaver-Brooks 50-hp. Scotch marine type boiler, carrying a pressure of 25 to 30 lbs., which is natural gas-fired. It is eventually planned to install a high-temperature curing system. There are two principal reasons for the change, chief of which is the management's belief that a high temperature curing produces a consistently better block; and secondly, the plant will be able to operate two shifts without added kiln space.

To change from low to high temperature curing is a more involved process than merely adding horsepower to the boiler. Crescent Concrete is now erecting insulated sliding metal doors on the kilns, and a perforated steam pipe running the entire length of the kiln will be installed, together with a system of ducts for the warm air, dry-heat period. Since present kilns are built with lightweight aggregate block walls and a roof slab of the same material, no added insulation will be needed when the contemplated high temperature system is installed. The plant will follow the approved curing cycle recommended by the Na-

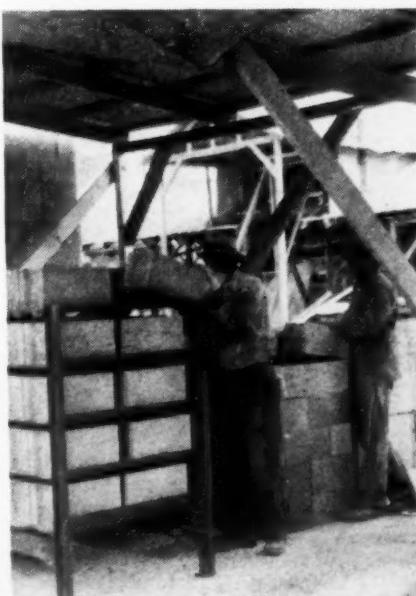
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Thos. Goodbee, in center, flanked by J. Franklin and J. H. Besser, at the time of New Orleans meeting of N.C.M.A.



Fork lift truck raising cube of block to third tier for yard storage



Block being cubed in covered, paved area back of plant



Slag storage in foreground; Superock aggregate in background with plant in the rear

Two New Plants To Meet Increasing Demands For Concrete Pipe

Carolina Concrete Pipe Co., operating in two States adds to curing and production capacity in all three plants

THREE PLANTS are operated by the Carolina Concrete Pipe Co. in North and South Carolina. They are located at Charlotte and Lilesville, N. C., and at Columbia, S. C. The main offices are at the Charlotte operations on Derita road in the northern section of the city. The Charlotte operation is an entirely new one which went into production during December of 1947, replacing an older plant in the west part of town. The Columbia plant is practically new, for the new plant was built there while the old one was still in operation, and at the time of inspection part of the older Columbia plant was still operating. However, this article deals only with the two newer plants.

Both these new plants use somewhat similar techniques in handling aggregates. The main structure at the Charlotte operation sets back from the railroad a sufficient distance so that aggregates can be unloaded from gondolas to ground storage by an Osgood crane mounted on rubber tires. This same crane fills the day bins over the 8000-lb. capacity Butler batchers. This arrangement keeps the height of the building lower than where the conventional system of overhead bins is used.

At Columbia a somewhat similar set-up is used except here a Michigan Power shovel with a clamshell bucket is employed. The latter building is 30 ft. high at its highest point. Both plants are neat structures, and are built of concrete block with the roofs of the buildings and kilns made of Flexicore from the new plant of W.

R. Bonsal & Co., at Lilesville. Six kilns at the Charlotte plant are 22 ft. wide, 100 ft. long, and 12 ft. high. This wide span constructed with flexicore slabs makes a nice job. The roof slopes 3 in. in the 100-ft. length, and is covered with asphaltic-gravel roofing. The six kilns, open at both ends, are provided with R. C. Mahon Co. roll-up type steel doors. These steel doors, which are raised and lowered by a convenient hand wheel, are easy to operate and are tight. The kilns are high enough to admit the Ross high-lift truck and lift a 60-in. dia. pipe, the largest size made at this operation. A Towmotor and a Lewis-Sheppard air cooled lift truck are available for other uses. The Ross lift truck (see **ROCK PRODUCTS**, September, 1947, p. 135) has a special front attachment that can be attached and removed readily. It consists of a large steel plate with holes in it at calculated points. These holes receive pipe-like arms which permit the truck to lift a considerable number of pipe at one time. By changing the positions of the pipe, only a minute job, most any diameter pipe can be lifted.

Curing Methods and Equipment

In each kiln are three, 2-in. dia. pipes suspended from the ceiling and two similar pipes installed on the side, one on each side. Each pipe has 3/32-in. dia. (approx.) holes about 5-ft. apart. A 4-in. steam header pipe serves all the kilns with valves on the inside and in a corner of each kiln, the valve stem extending through the end wall. Electric lights inside the

kiln are of a type that will withstand the moisture and the temperature. The temperature in the kiln is in the 130 to 140 deg. F. range. Concrete pipe are cured with live steam.

Steam is supplied by a 100 hp. Cy clotherm automatic steam generating unit, oil-fired. It is an entirely automatic operation with steam pressures kept at 42 to 50 lb. It also supplies hot water for the modern change and shower rooms. There are separate change rooms for the white and colored help. A 6000-gal. oil storage tank is in the assembly.

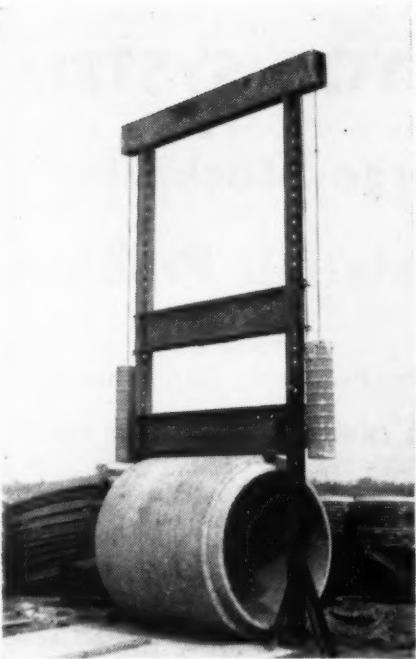
Manufacturing Steps

Sand and gravel is secured from the Material Sales Co. from plants near Lilesville. Two sizes of gravel are used; $\frac{1}{2}$ -in. for the McCracken machine and $\frac{1}{4}$ -in. for the Quinn pipe machine. Sacked cement is used at both plants. The two pipe machines at Charlotte are in a line and parallel the railroad track. The McCracken machine makes the 4-in. through 24-in. diameter pipe. The Quinn unit makes the 30-in. to 60-in. pipe. The latter has three tamper sticks which are used for the larger pipe, one each for inside and outside and one for the center section. This unit is served by an inclined chain drag from a 28-cu. ft. Besser mixer. The chain drag is under the control of the operator and operates only while the pipe form is being filled. A similar Quinn machine and set up is used at the Columbia plant. The McCracken machine at Charlotte receives its feed from a similar 28 cu. ft. Besser mixer, but a skip delivers to the pipe machine. Spigot-and-bell, tongue-and-grooved pipe, plain and reinforced are made at both plants.

The Charlotte plant uses a power driven Banding roll and a Taylor electric spot welder for forming and welding the cages. At this plant the rolls of wire are stored at one end of the building, however, at Columbia the main building has a second floor (of wood) and rolls of wire and other materials are stored on this second floor. The items are raised and lowered by one-ton chain blocks. Operating rooms of both plants are wide and roomy, and are laid out for efficient and economical operation. The plant at Charlotte is located on one of the



Modern plant and storage yard at Columbia, S. C.

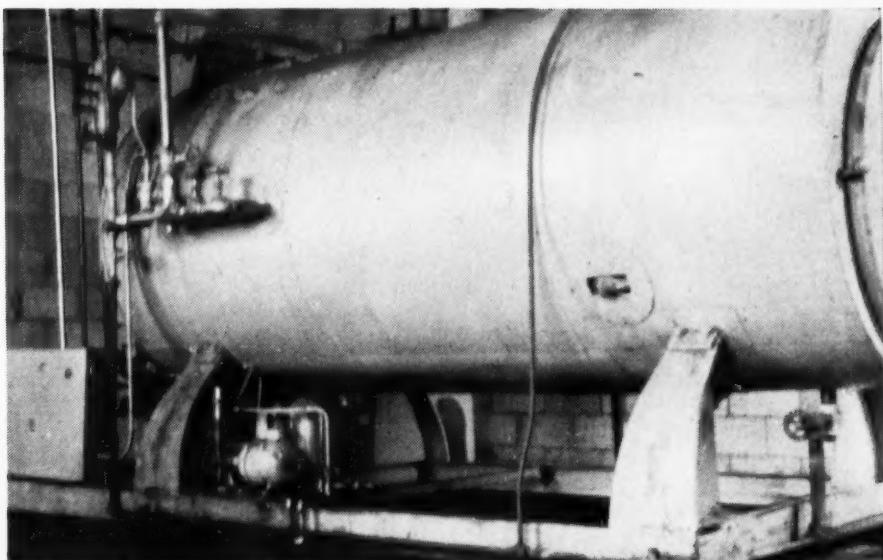


Pipe testing device designed to handle nearly any diameter pipe. Gauge for observing breaking strength is mounted between the two horizontal cross beams. Holes in vertical members are for pins that hold cross beams in position

main highways into the city, and has a large area for outside storage of pipe. A neat office of concrete block construction has been built at the Charlotte plant.

At Charlotte the company has a home-made pipe testing machine, shown in the illustration. The two horizontal 14-in. steel "I" beams can be raised and lowered to suit most any diameter of pipe. Holes drilled in the vertical legs permit the cross arms to be solidly pegged in place. The lower arm can be raised and lowered by counterweights. The hydraulic pressure unit and recording device go in between the two horizontal cross arms.

At Columbia the plant has one Quinn and two McCracken machines and six kilns somewhat like those previously described. The largest size



Steam generating plant

made is 48-in. pipe although 54-in. can be manufactured if necessary. One of the McCracken machines is in the old part of the plant, and makes the smaller pipe. It has no mechanical means of handling the aggregates as the tonnage used is small. However, the Quinn and the other McCracken machine both have a rather novel arrangement for handling and weighing the aggregates. Each machine has a low structure that houses a Winslow Scale batcher. This unit rides an overhead track structure. The weigh batcher is filled from two small steel bins that hold about 23 tons (total). One object here is to have a low bin so the clamshell can more easily fill the bins. Aggregates are delivered to the plant in 15-ton trucks. The crushed rock is from the Palmetto quarry in Columbia.

The second McCracken machine is about a year old but the Quinn ma-

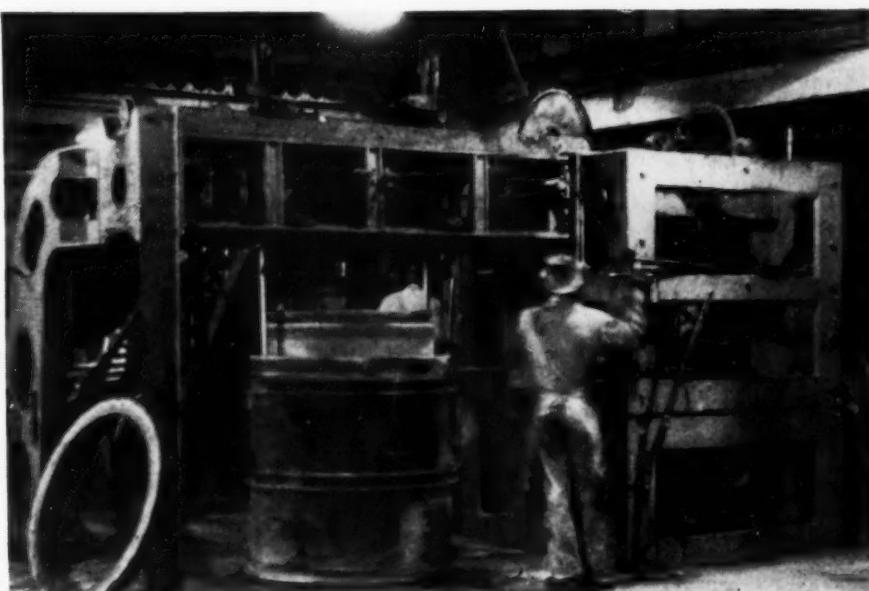
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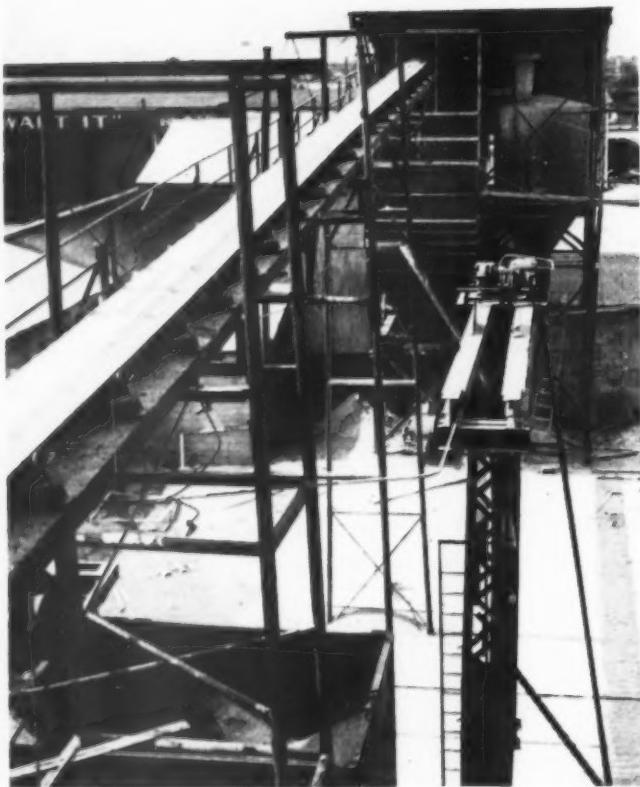
Rolling steel doors on curing kilns



Lift truck with pallet carries a number of small pipe



Tamper pipe machine with inclined drag conveyor feeding concrete from the rear, Columbia, S. C.,



Top of the cross conveyor looking north. Cement silo may be seen over top of bin. A canopy is to be built over entire conveyor belt system

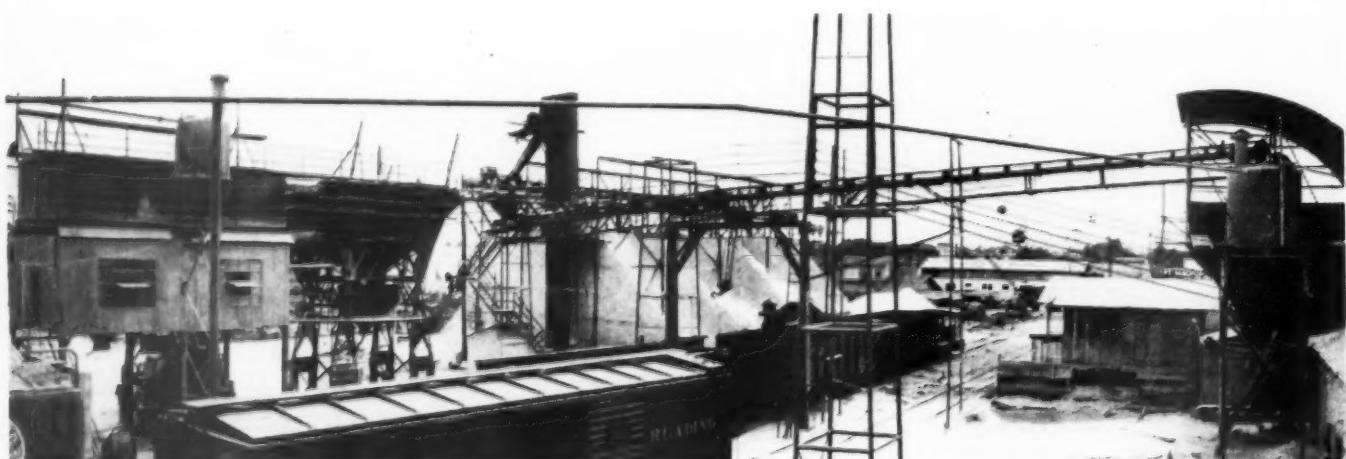
CAR SHORTAGES in the United States are headline news, and trade literature and convention programs point to the urgency of the problem. Practically all producers of concrete masonry have felt the pinch themselves in one way or another, but few do anything about it because that particular problem always appears to be the other fellow's. The Hart Concrete Products Co. of Tampa, Fla., under the direction of President J. L. Hart, has pointed out one way that car shortages can be alleviated, and that is by speeding up the unloading of aggregates at the plant.

In doing this at his Tampa operations, Mr. Hart is not only making his contribution to the elimination of

this problem, but is adding dollar earnings to his own business. One of the new Robins car shakeouts has been installed as part of this program. This is a five-ton, steel fabricated frame that is placed on top of the hoppered car.

The Hart Concrete Products Co. has designed its overhead trolley crane for lowering and raising of the Robins car shakeout on and off the cars. The shakeout has a large electric motor mounted on top of the assembly that operates an unbalanced pulley causing the entire shaker to vibrate. This vibration is imparted to the car, resulting in the car being unloaded in a fraction of the time ordinarily required.

Before installing the Robins car shakeout, it required three to four men to unload the aggregate. Sometimes it took two to three hours to unload one car, where now a car is unloaded in 15 to 25 minutes. Prior to the time the company installed its unloading system it required two cranes for unloading, stockpiling the materials and placing them in batcher bins. Operating the cranes 9 to 12 hours per day, a total of 5 to 7 men unloaded 5 to 7 cars daily. Since installing the ready mixed concrete plant, 9 to 11 cars per day are unloaded with only two men handling materials into storage bins or placing materials in the batcher bins for both the concrete block and ready mixed



Cement pumping system, showing both cement silos, one for ready mixed concrete plant and the other for the block plant. Framework to the right of the elevator is for the canopy to be installed over the storage bins

CONVEYOR SYSTEM and Large Stockpiles Solve Materials Problem

Hart Concrete Products Co., Tampa, Fla., has bulk cement car and its own switching locomotive to reduce car shortage. Also sells large volume of ready mixed concrete, and plans to make line of precast concrete products

By WALTER B. LENHART

concrete plant in 8 to 9 hours per day. Cranes are no longer used for these operations. However, this many cars could not be handled in one day if it was not for having its own 25-ton locomotive to shift the cars over the unloading hopper. Since there are two tracks parallel to each other, it is very convenient to switch the cars. C. Wilder, assistant manager, says this is a great labor saving system.

Aggregates used in the Hartstone plant comprise rock shipped from Brookville, Fla., and sand from Davenport, Fla. In addition the company has its own special railroad box car which shuttles back and forth from the plant to the Florida Portland Cement plant for movement of bulk cement. With the use of the car shake-out and locomotive, car demurrage is reduced to a minimum. We are inclined to think that Mr. Hart has made a real contribution to the car shortage problem.

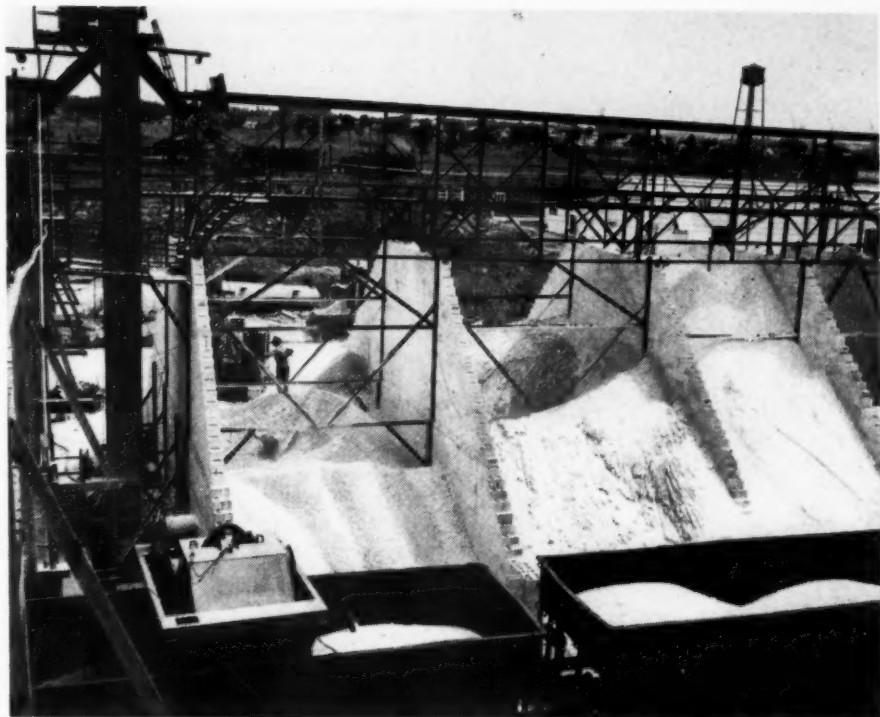
On an inspection trip through this plant it was noted that this attention to detail and the tendency to inaugurate good practice into the business runs all through the plant. For instance, the equipment of the Scientific Concrete Service Corporation has been installed in the block plant. Concrete accurately proportioned makes a better and smoother looking block that more easily meets Florida specifications. Strengths are more consistent and reliable and portland cement is saved. For block production, a Besser SuperVibrapac is used and a second machine is to be installed shortly. These certified blocks are marketed under the trade name of "Hartstone." Tile in 4-, 6-, and 8-in. diameter sizes are also manufactured, using a W. E. Dunn Mfg. Co. machine.

The batcher bin for the block plant is located between the two block machine mixers. Under the bin is a Scientific Control Dial Scale that is automatically controlled by push button, and after the materials are weighed it discharges onto a 24-in. reversible conveyor belt, so one man can take care of the mixing and emptying of the mixers, raising and lowering the skip hoist. All operations are handled by push button control—as there are air rams on the mixer gate.

Hart Concrete Products Co. is the only concrete block manufacturer in this vicinity having the Fuller-Kinyon system for unloading bulk cement from the specially designed box car by pumping the cement direct from the car to the block plant which is a distance of 200 ft., and the ready mixed plant, a distance of 85 ft., or placing it in storage out of the box car into a specially designed room built of Hartstone concrete block.

Ready Mixed Concrete

About the time Mr. Hart started making some of the installations referred to, he decided to go into the ready mixed concrete business. He made an extended trip of inspection, and one idea that he came back with

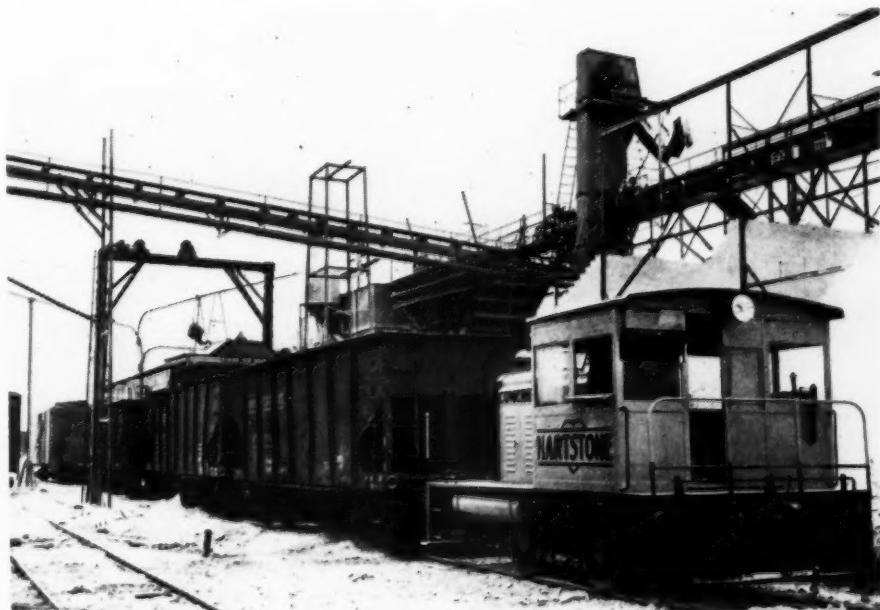


Close-up of elevator and shuttle conveyor over the top of the reclaiming tunnel and storage bin

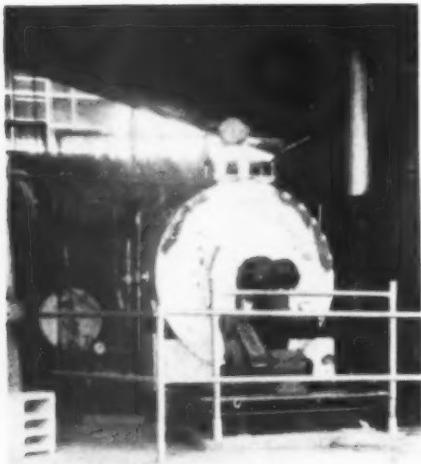
was that waiting time at the plant was a substantial cost factor in the production of ready mixed concrete. Three sets of batching equipment, using the scale and control equipment of the Scientific Concrete Corporation, were therefore installed. These three batchers, arranged at one end of the aggregate storage section, are in a single row. Ample yard space is in front and behind the batchers so that trucks can load quickly and be on their way. For the fleet of White trucks recently purchased, three 5-cu. yd. and four 3-cu. yd. Jaeger '47 model dual mixers are mounted on the re-chassis. Mr. Hart also is president of

the Hart Machinery Co., and most of the bins, conveyors, elevators, and related equipment are fabricated in his own shop.

For aggregate the company has a ground storage system comprising four compartments each separated by a Hartstone concrete brick wall. Additional compartments are now being added so that aggregate for the block and ready mixed concrete sections will be more readily available. Total storage capacity eventually will be 150 carloads. These storage sections are arranged in a straight line with a reclaiming tunnel below. The sequence



Showing elevator, shuttle conveyor that discharges either into storage bins or to bins for ready mixed concrete plant. Cross conveyor supplies block plant. Note car shakeout over car and company locomotive for switching



Steam generator supplies five kilns

of filling the stockpile and reclaiming is as follows:

The car is spotted over the unloading hopper and the car shaker placed in service. The hopper serves a short cross conveyor that delivers material to a bucket elevator. The bucket elevator in turn discharges to a horizontal belt on top of the storage pile that unloads to the ground storage below. The reclaiming belt in the tunnel below reclaims the material and moves it to this same bucket elevator that can discharge to an elevated cross conveyor serving the block plant, or the elevator can dump to an elevated conveyor belt serving the three batcher assemblies. However, materials can be stored into any of the batcher bins direct from the car and any material the batcher bins cannot hold is then discharged into the storage bins.

Hart Concrete Products Co. has installed a canopy over the entire conveyor system and also over the batcher bins at the block plant and ready mixed concrete plant so Florida's heavy rains will not interrupt production in the two plants.

In the Tampa area it is common practice to charge from 2 to 5¢ per

block for deliveries, the rate depending mostly upon the distance hauled. The Hart Concrete Products Co. pays its hauler on a piece-work basis with the rate sufficient so that the men have especially good earnings. Blocks are loaded and unloaded by hand because delivery of un-blemished blocks is desired, and the company feels that hand loading will result in less chipping, corner damage, etc. However, mechanical equipment is used in and about the kilns, plant and yard. Clark and Erickson lift truck equipment is used for this work.

Five kilns are available for steam curing the blocks and this, incidentally, is another deviation from most Florida practice, for most manufacturers of concrete masonry in that state do not use steam curing. Mr. Hart's kilns are open at both ends, and are sufficiently large to hold a day's production. Steam is supplied by a Clever-Brooks fully automatic, oil-fired steam generating plant.

Yard inventories are low because of sales demand and quick development of specification strengths due to the steam curing. Premium prices are received for the block.

Most of the aggregate used for block and ready mixed concrete is the oolitic limestone from the Brooksville, Fla., area, but some blocks are made from cinders and lightweight slags. Later the company expects to manufacture concrete joists, tile, and concrete window frames. Two stone saws are provided for cutting concrete block to smaller sizes.

The plant is located on highway No. 60 in the eastern section of Tampa. Offices at the plant are for both the Hart Concrete Products Co. and the Hart Machinery Co. The plant is on the Seaboard Air Line railroad.

High-Temperature Curing

(Continued from page 115)

tional Concrete Masonry Association. This curing cycle follows: (1) Maximum temperature, 165 to 175 deg. F.; (2) holding time after kiln is filled, 2-hr.; (3) not less than 3-hr. live steam time, with 1-hr. at ceiling temperature; (4) heat increase not to exceed 60 deg. per hr.; (5) soaking time: 8-hr. (live steam turned off); and (6) dry air circulation, 3-hr.

Selling and Advertising Methods

Block and brick sales are made at both wholesale and retail levels, with wholesale deliveries to building supply dealers in a radius of 60 miles made by contract haulers. Breakdown of total sales reveal that roughly 80 per cent are for credit (mostly wholesale) and 20 per cent represent cash.

Confining newspaper advertising to local Sunday supplements, a weekly ad is run in the rotogravure section featuring a different house or commercial "Crescent Concrete block structure" each week. The registered name "Crestone" is used extensively in all advertising. According to Bob Wilkerson, secretary-treasurer and



Two types of rubber-tired batch buggies; left, contains slag, and right, holds Superock

part owner of the business, the "most effective advertising is placement of company job signs on buildings under construction."

Masonry Saw Dust Arrestor

A large box, 4- x 6- x 8-ft., fitted with baffles and water spray, has been constructed of block to act as a dust arrestor for use with a Clipper Masonry saw. A large suction fan draws dust-laden air from the saw operation and introduces it into the dust arrestor box. This system is highly successful, as indicated by the quantity of sediment clinging to the walls of the water spray section.

This progressive concern is owned jointly by Robert L. Wilkerson and Thos. J. Goodbee.

Staining, Pop-Outs In Cinder Concrete

CAUSES and prevention of staining and pop-outs in cinder concrete are discussed in a new report by S. G. Seaton, covering investigations conducted by the Portland Cement Association in cooperation with the cinder concrete masonry industry.

Approximately three years of intensive work were spent in field and laboratory. Outstanding achievements of the study include development of a simple method of testing and classifying cinders as to their tendency to produce stains and certain types of pop-outs, and the development of practical methods of treating cinders to prevent or greatly minimize such trouble.

Cinder block manufacturers are urged to consider carefully the advantages of testing cinders periodically, the report states. Equipment is inexpensive and the test can be readily performed by the plant foreman. Various methods of treating cinders are also described. Complete details may be obtained from the Portland Cement Association or National Concrete Masonry Association, 38 South Dearborn St., Chicago 3, Ill.

WHITEWATER CONCRETE PRODUCTS Co., Whitewater, Wis., has been organized with 600 shares, no par value, and a minimum capital of \$1000, to deal in concrete block, brick, tile, and other building materials. Mercedes D. Felsing and Agnes J. Tirpak are the incorporators.



Travelling batcher scale that serves two block machines

NEW MACHINERY

Truck Retrieves Pallets

THE ELWELL-PARKER ELECTRIC CO., Cleveland, Ohio, has developed a pallet retriever attached to a standard



Lift truck equipped with pallet retriever

fork-type truck whereby pallets may be used in the customary method for fast loading of freight cars yet remain in the owner's possession. With this attachment, the lift truck owner has practically all the advantages of the truck-pallet method in his own plant and also in loading cars, without loss.

This accessory is light, compact and attachable to the forward end of the truck. A load-handling or stabilizing mechanism consists of two hydraulically actuated pantograph-type rams which terminate in a screen frame that remains in fixed position with respect to the load. Rams are self-adjusting to fit and follow the contour and vertical or lateral motion of the load, while the truck with the pallet backs away and withdraws the pallet from beneath the load. The rams can be operated in corners of box cars since they may be actuated independently or together. Lime, cement, silica sand and other producers of sacked materials should be interested in this development.

Heavy-Duty Lift Truck

MIXERMOBILE MANUFACTURERS, Portland, Ore., have developed a new heavy-duty lift truck capable of handling loads up to 16,000 lbs. Mounted on a tricycle running gear, the "Wagnergmobile Duo-Way Lift" is a front-wheel drive, rear-wheel steer, with a Timken differential. The new unit is powered by a 114 hp. Chrysler industrial engine and capable of operating

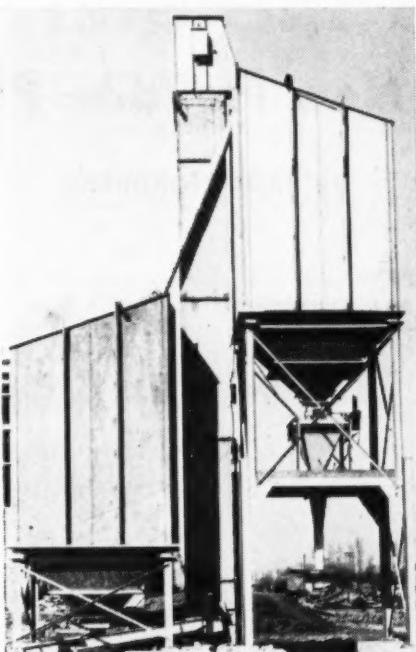


Lift truck that affords operator equal visibility either forward or back

at speeds up to 20 m.p.h. forward or 30 m.p.h. in reverse. Because lift truck operation is approximately evenly divided in both directions, the operator is placed sideways on the machine, and in this manner obtains equal visibility while operating in either direction, according to the manufacturer.

Portable Batching Plant

BLAW-KNOX CO., Pittsburgh, Penn., has begun commercial production on its newly developed portable bulk cement batching plant. Improved portability and the use of auxiliary cement bins permit easy and economical expansion of capacity, according to the manufacturer. A screw conveyor on 20 ft. centers delivers cement from a track hopper to a bucket elevator for transfer to the overhead plant bin, that has provision for over-



Portable batching plant, showing main overhead bin and one auxiliary bin at ground level

flow to be chuted to one or more auxiliary bins at ground level. These auxiliary bins have provision for gravity discharge to the bucket elevator for re-elevation to the main plant bin when needed. Overhead and auxiliary bins are of the same design, and are made in 200, 400, 600, or 800 bbl. capacities.

Develop Space Heater

THERMOBLOC DIVISION, Prat-Daniel Corp., East Port Chester, Conn., has developed a new space heater that burns either No. 3 fuel oil or gas, and is capable of delivering 550,000 B.t.u. per hour, according to the manufacturer. This compact heating unit has a built-in blower and requires a floor space 30-in. in diameter. The unit is said to deliver warm air without excessive velocity or draft; and in summer the fan can be used for cooling. An added feature of this heater is its completely automatic operation.

Expand Lift-Truck Series

CLARK TRUCKTRACTOR DIVISION OF Clark Equipment Co., Buchanan, Mich., announces a third model in its

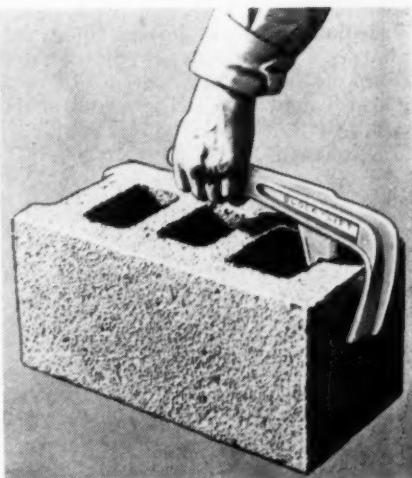


Fork truck of 6000 lb. capacity

series of fork trucks specifically designed for outdoor handling operations. This latest model, known as the Yardlift "60" (6000 lb. capacity), is a companion to models 40 and 20, of 4000 and 2000 lb. capacities, respectively. Features of the new machine have been proven in the field in use with the other two models, according to J. H. W. Conklin, sales manager, and include a 6-cylinder, 50 hp. engine; pivoted steering axle; and full-floating drive-axle. Standard lift is 112-in., with an over-all height of 85-in.

Block Handling Tool

BLOCK-LIFT CO., Mt. Vernon, Ohio, announces a new tool for handling individual, cured block. This tool consists of a handle with an open jaw at one end that may be fitted over the web at either end of any size block, with the weight of the block causing a friction grip that is released by placing the block in place. The tool is manufactured from cast aluminum and weighs 32 oz.



Tool for placing individual, cured block in load or wall



Looking at kilns from discharge end. Note grizzly over which clinker flows to cooling pit

The Carter-Waters Corp., Kansas City, Mo., starts production in modern plant. This additional capacity will help alleviate the critical shortage of lightweight aggregates for concrete products industry

Rotary Kilns Start Rolling At New Haydite Plant

A NEW HAYDITE PLANT, owned and operated by The Carter-Waters Corp., Kansas City, Mo., started production in April this year, in response to the critical demand for lightweight aggregates required for concrete masonry manufacture and for lightweight structural concrete. The plant is entirely of new and modern equipment, representing a large capital investment, and triples the company's available output, supplementing production from a plant long in operation in Kansas City.

Haydite is the product of expansion, in rotary kilns, of shale having certain physical properties and more or less definite mineralogical composition. A deposit of 65 acres was acquired 35 miles north of Kansas City on Missouri route 71 and on the Chicago and Great Western railroad, of shale that meets optimum requirements for expansion as required by the company and based upon its many years of operating experience and research.

Geologically, the deposit under exploitation is known as the Weston shale. Analysis of the shale falls within the range of 50-60 per cent silica,

By BROR NORDBERG

20-30 per cent alumina and 6-7 per cent iron oxides. It contains 3 or 4 per cent alkalis, less than 1 per cent CaO and has an ignition loss of 8 per cent. Covered by modest overburden of topsoil and high calcium limestone,



Primary breaking shale with lagged rolls

which may later be processed into agricultural limestone and commercial aggregates, there is a 75-ft. usable ledge of shale. Unweathered shale has better burning characteristics than an overlaying ledge of weathered material of essentially the same mineral composition. Preliminary work of excavation is on a 28-ft. lift using jack-hammers for blast hole drilling. A caterpillar mounted Traxcavator with $\frac{3}{4}$ -cu. yd. bucket loads to end-dump trucks which haul a very short distance to the shale crushers.

The plant consists essentially of shale crushing equipment, belt conveyor transportation to raw material storage bins, two oil-fired rotary kilns, open storage for cooling and ageing the kiln product, hoist and derrick for reclamation of the expanded product to crushing equipment, elevated

screening plant over finished product storage bins and belt conveyor loading of railroad cars and trucks. Four sizes of product are produced, covering the range from $\frac{1}{2}$ in. top to dust. They are $\frac{1}{2}$ - $\frac{3}{8}$ -in., $\frac{3}{8}$ -in. to No. 4 sieve, No. 4 to No. 8 sieve, and minus No. 8. Operations are controlled to produce a finished product not to exceed a weight of 1100 lb. per cu. yd. for the coarse size ($\frac{3}{8}$ - $\frac{1}{2}$ -in.) or 1550 lb. for the fine fraction, yielding a structural concrete weighing 100 lb. per cu. ft. or a 45 per cent core space, three core concrete masonry unit weighing 25 to 26 lb. per 8-in. equivalent size. Concrete of that weight will produce masonry units to pass all strength specifications including the federal specification of 1000 p.s.i. minimum compressive strength for Class A building units.

Preliminary Processing

Quarry-run shale is dumped into a hopper, and gravity-fed through two Eagle double-roll toothed shale crushers consecutively. Primary reduction is to 4-6 in. size. The secondary crusher product is minus 2 in., which is conveyed by 24-in. belt conveyor to an



Paul Murdock, superintendent, left, and President A. R. Waters



Loading shale into truck

800 cu. yd. concrete stave silo kiln feed bin. A graded feed size into the kilns is important since, in expansion through the application of heat in the kilns, the relative ratio of particle sizes is roughly retained. Large kiln feed bin capacity enables 24 hr. kiln operation, with the quarry on a single 8-hr. shift. Feed into each of two kilns is by an independent combination of a draw-off belt conveyor, reciprocating feeder and bucket elevator, the conveyors having variable speed drives.

The kilns are 6- x 60-ft., sloped 1 in. to the lineal foot, and are turned within a speed range of 1½-2½ r.p.m. by a variable speed drive. They are lined throughout with 6-in. fire brick and are fired by Hauck oil atomizers, and exhaust (natural draft) through individual 50-ft. stacks. Expansion within the rotary kilns is a function of temperature and related factors of time, draft, particle size, moisture content, etc. Changes in any of these burning conditions will alter the weight of the final product and therefore the compressive strength of the aggregate; for example, the application of too much heat will result in excessive expansion.

In achieving the desired physical properties of the end product, the material is heated to a maximum temperature between 2100 deg. F. and 2150 deg. F. Time of exposure to heat in passage through the kilns is about 40 minutes. Yield is approximately 2 cu. yd. of expanded material for each cubic yard of shale fed. Each kiln produces 160 to 180 cu. yd. of product per day under favorable conditions.

Discharge is into a clinker storage pit of 10,000 cu. yd. capacity where the expanded shale is cooled and allowed to age approximately two weeks before reclamation for crushing and screening. Ageing of the product apparently has a desirable result.

Handling from Pit to Crusher

Re-handling in the storage pit and reclamation to a crusher feed hopper is done by an American Hoist and Derrick 2-cu. yd. clamshell operated from an 80-ft. revolving boom and 95-ft. mast. Crushing is done in two stages, with the second crushing machine in closed circuit with vibrating sizing screens. The primary is a coal-breaker type of jaw crusher elevated over a surge tank. It will take a feed up to 3- x 4-ft. size of chunk and discharges a product of 4- to 6-in. into the surge tank. A reciprocating feeder and inclined bucket elevator transfers this material from the surge tank into an Eagle Iron Works rim grinder. The latter machine resembles a dry pan but has an adjustable, circumferential inner ring to govern the size of product that will discharge. In this case the rim is set for ¾-in. top size and the discharge is elevated by bucket elevator to sizing screens in a screen house superimposed over storage bins for finished product.

Sizing is done over two Deister Machine Co. Plato double-deck vibrating



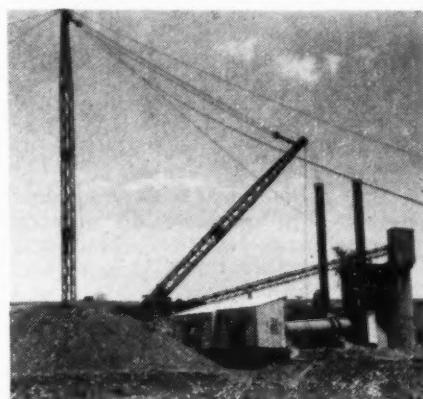
Layout of plant, showing kilns, to the left; inclined conveyor filling feed bins, derrick in center to handle Haydite in storage and to crushers; screens and storage, to the right

screens, 4- x 12-ft., and 4- x 8-ft. size, operated in series, and the four products chute into their respective concrete stave silo storage bins. Plus ½-in. off the top deck of number one screen is spouted back to the rim grinder.

Total storage is 1800 cu. yd. in four silos and loading out is done by a common 24-in. belt conveyor, into railroad cars or into trucks by means of a transfer. Any combination of the sev-

eral sizes may be blended on this belt by setting of the discharge gates which pay out Haydite from the respective silos.

Relative proportions of the sizes of product produced may be varied in several ways. If the uncrushed product is wetted down in storage, more fines will result from crushing. Screen cloth openings can, of course, be changed as can be the adjustable rim on the grinder when it is desired to



Derrick for handling kiln discharge. Raw feed bins on the right



Primary and secondary crusher set-up



Close-up of 60-ft. kilns fed by elevator



Jaw crusher fed Haydite by derrick

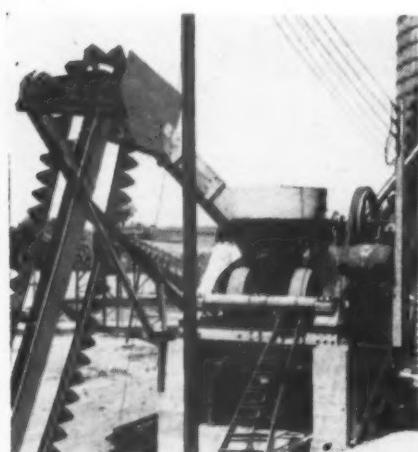
vary the respective amount of coarse and fine sizes produced.

The plant was designed by A. W. Baldwin in cooperation with outside engineers on certain specialized phases of the work. The design provides for the possible future installation of two additional kilns which



Three-drum hoist to operate derrick for handling Haydite in discharge pit and to crushers

would raise production to 640 to 720 cu. yd. of haydite daily. Cooperating in the design was United Iron Works, which manufactured and supplied the bulk of the equipment, including the kilns, belt conveyors, bucket elevators, feeders and jaw crusher.



Dry pan for secondary crushing of Haydite

Albert R. Waters is president of The Carter-Waters Corp. and E. Kemper Carter is chairman of the board of directors. Other official personnel include W. E. Beanway, secretary-treasurer; N. B. Smith, vice-president and sales manager; George W. Kulhavy, in charge of haydite and building product sales; and Paul Murdock and Neil Lidstone, plant superintendents.

Carolina Pipe

(Continued from page 117)

chine is quite new. Towlmots are used for mechanical transportation of the larger pipe; the small pipe in hand lorries. They have the same boiler set-up here as at Charlotte.

Official personnel includes: H. O. Strohecker, Jr., vice-president; L. C. Harper, assistant secretary and treasurer; Fred L. Mays, general manager for the South Carolina area; and J. B. Hunt, Sr., sales manager for North Carolina. Plant superintendents are: M. W. White, Charlotte, N. C.; W. W. Des Champs, Columbia, S. C.; and W. P. Porter, Lilesville, N. C.

Practical Research

(Continued from page 113)

tions of concrete pipe and there is absolutely no separation of the fine and coarse aggregates in the spinning, and the new process, because of the very dry concrete mixture employed in the manufacture of the pipe. And the test results, as said before, prove beyond any question of a doubt, that the concrete exceeds 10,000 p.s.i. and up to 15,000 p.s.i. in compressive strengths. And remember, this concrete is made with standard portland cement, Type I, with sand and coarse aggregates and no admix of any kind. So, from where I sit, it seems that some of our research experts in this country have a lot to learn from the Practical Research men in Australia and elsewhere.

But when I showed Mr. Fitzpatrick some of my brochures depicting the manufacture and installation of reinforced concrete pipe made in diameters up to 12 ft. and in lengths up to 24 ft., with which he was already familiar, he said our American concrete pipe manufacturers have excelled in this direction more than anywhere else in the World.

From this, you can see that we are best at the two extremes—the very small and the very large diameter pipe. Because the bulk of the pipe business is in the middle brackets, we must close this gap in this country.

Shown in two pictures of this article is the manufacture of centrifugal concrete pipe, by the Valley Concrete Pipe and Products Co., Yuba City, Calif. This is some of the best centrifugal concrete pipe I have ever seen made in this country, and from the pictures, Figs. 11 and 12, you can see how carefully it is made and how neat the workmen keep the spinning equipment; I was able for the first time to get close-up pictures of the opera-

tions, without spattering my camera. This pressure pipe was for a contract in Reno, Nevada. Gilbert D. Williamson, president of this company and one of my hunting pals, tells me he wants to retire; he has more money than he knows what to do with but worries about this and that more than anyone I know. I have often told him he will be promoting and trying to sell concrete pipe in the other world, which ever place he may go.

Compare Availability of Modular Concrete Products

THE DEPARTMENT OF EDUCATION AND RESEARCH of the American Institute of Architects, in an attempt to determine to what extent modular clay and concrete masonry products, dimensioned in accordance with ASA Project, A62, are available locally, recently addressed a questionnaire to its collaborators in each of its eighty-eight chapters.

Replies from 50 chapters which locally made clay and concrete masonry units were compared according to *Moduletter Number 54*. Of these 50 chapters, 22 per cent report modular units not available, and the other 78 per cent report they are available. Conversion to modular sizes has been far more complete for concrete masonry units than for clay products. Concrete masonry units are predominantly available to 74 per cent and clay products predominantly available to 36 per cent of the 50 chapters.

The survey concerned locally manufactured products only. Many types of clay products, such as face brick and glazed tile, are not made locally so far as most of these chapters are concerned, yet face brick and glazed tile in modular sizes are widely distributed throughout most of the country. Had this element been considered, the general availability of modular clay products would have compared favorably with that of modular concrete masonry units.

Lighter, Stronger Cinder Block, Brick

LIGHTER, stronger cinder block and brick, with more fire resistance have been announced by the local plant of the Universal Concrete Pipe Co., Zanesville, Ohio. In a recent experiment, one of the blocks was placed in an oven registering 1800 deg. F., and then doused immediately in cold water. Except for a slight scorching, the block was as good as new. Larry Miller, plant manager, said an average of 6000 brick or 600 block can be produced per hour.

MILWAUKEE BRIKCRETE CO., INC., Milwaukee, Wis., has been organized to manufacture concrete block, fire, paving and building brick. Minimum capital is listed at \$6000 with 150 shares, par value \$100. John Vander Holk, Frances Vander Holk and Louis E. Fichoux are the incorporators.

Mortarless Block Constructs New Plant to Meet Demand

By GIBBONS CLARK

CONCRETE block plant yards customarily have a completed section of wall to show prospective customers how block can be used, thereby making sales through visual means. The sample wall in the yard of the Mortarless Interlocking Block Co., Yakima, Wash., has a feature which few, if any, companies producing concrete block can show about-to-be customers.

It all happened when a huge semi-trailer van, fully loaded, crashed into the sample wall. That wall should have crumpled to the ground, but today the folks at Mortarless Interlocking Block are proudly showing this same wall, in excellent condition, to customers who see the visible evidence of what they are told.

This amazing incident sold for the company its largest job to date, a 50-x 200-ft. structure in Wapato, Wash., which is used for hop baling for export.

This progressive company is getting its good share of the large volume of concrete block business now enjoying a peak curve in Yakima. Should the day come when the current popularity of concrete blocks should wane or be greatly reduced, the Yakima company's plant is such that it easily can be converted for pipe production.

The Mortarless Interlocking Block Co. was established May 1, 1947. Its plant area comprises over one acre of ground. Two machines are in use at present with a plant output of 800 block per machine. The plant manager, Alden Flint, plans on adding a third shift; the regular and a swing shift are in effect at present.

A branch plant is to be established in the Spring of 1948 in the lower Yakima valley at Prosser, Wash. The present main Yakima plant is operated by Mr. Flint who holds the territorial rights for the patented mortar-

less concrete block from the parent company, the Mortarless Tile Machine Co., of Los Angeles, Calif., in Yakima and Benton counties, Wash.

No retail sales are made at the Yakima plant, only wholesale sales to contractors and to lumber yards. The home owner, however, is urged to build his own concrete walls if they are not too high. This construction is said to be popular with Yakima valley fruit growers and farmers for warehouses. This mortarless feature as well as the interlocking of the block are said to provide excellent talking points.

These block are produced on the patented mortarless interlocking machine and are placed, green, in two new steam curing rooms at the Yakima plant. They are reinforced horizontally and vertically thus possessing great strength which, together with the 2-in. steel tie-rod placed in the cores and filled with concrete at certain intervals for certain height walls, provide a strong, durable wall. For large buildings horizontal steel reinforcing is inserted in the cores every six feet as well as on the wall top.

The plant employs seven men on a shift. The company also has a pumice plant. Charles Brixia is plant superintendent.

GENERAL PUMICE CORPORATION, incorporated under the laws of New Mexico and qualified to do business under the laws of Texas, has acquired certain pumice deposits in northwestern New Mexico and will shortly absorb Pumice Building Materials, Inc., Lubbock, Tex., a block plant and a factory operation in the same city. A modern mining operation with crushing, grading and sizing equipment, capable of processing 1000 tons of mine-run pumice per day is being constructed, an announcement states.

L-Shaped Block

ROBERT BATES, Athens, Tenn., has applied for patent on a new L-shaped three-quarter block and brick which are said to be waterproof and can



L-shaped, three-quarter block, used for walls

be made in a variety of colors. The block have a 4-in. slot, leaving a 4-in. ventilator, and interlock in any position they are laid, according to Mr. Bates.

The product is made of cement and sand concrete, and forms can be set up at the building site. A three wheelbarrow mixer turns out some 600 block in 5 to 8 minutes which can be used in the wall in 25 to 30 hours in hot weather, according to the inventor.

New Uses for Vermiculite

ZONOLITE Co., Chicago, Ill., miner and processor of vermiculite, recently sponsored a meeting of the Producers' Council, Inc., Chicago, at which time savings in structural steel resulting from use of vermiculite building products were discussed. The group analyzed current developments in the use of vermiculite in all phases of construction.

R. C. Rasmussen of the Zonolite Co. and Edward R. Murphy, managing director of the Vermiculite Institute, research authority on applications of the mineral mica, spoke, after which an industrial short film, "Zonolite, the Wonder Material," was previewed. Visual demonstrations covering lightweight, fireproof, heat resistance, and labor saving aspects of the product were presented.

NEW DEVELOPMENTS in the use of vermiculite, in replacing sand or gravel in concrete and plaster, were hailed as "likely to revolutionize building construction," by MYRON W. STEARNS in a recent edition of *The Reader's Digest*.

Advantages listed included vermiculite's light weight; high melting point making it ideal for fireproofing; soundproofing qualities, and insulating properties.



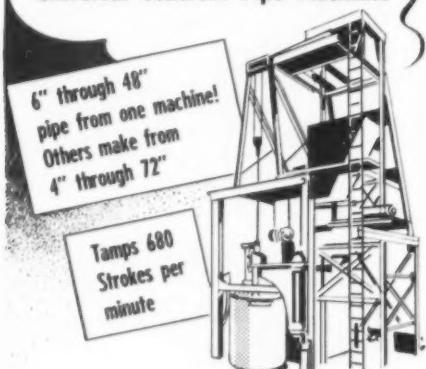
Storage yard with concrete block plant in background

Universal

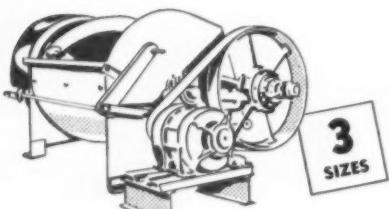
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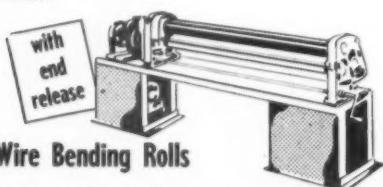


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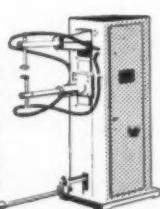
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Gene Olsen Organizes New Concern

EUGENE F. OLSEN, who recently relinquished control of the Stearns Manufacturing Co., has announced organization of the Gene Olsen Corp. at Adrian, Mich., to manufacture concrete products machinery. Authorized capital is listed as 3000 shares of preferred stock at \$100 and 3000 shares of common stock at \$10 for a total of \$330,000. Approximately 50,000 sq. ft. of space will be occupied by the company in a factory building owned by Mr. Olsen, and in addition to the complete line of concrete products plant equipment, service parts for certain other concrete machinery now in op-



Eugene F. Olsen



Robt. O. Davis

eration will be manufactured. Products will be sold under the trademark, "Gocorp."

Officers of the new company are: Eugene F. Olsen, president; Gene D. Olsen, vice-president and secretary; and Robert O. Davis, vice-president

and treasurer. Eugene F. Olsen, currently president of the Concrete Products Machinery Manufacturing Association, has been associated with concrete products companies since 1926, serving as president of the Anchor Concrete Machinery Co., president of the Consolidated Concrete Machinery Corp., vice-president and sales manager at Besser Manufacturing Co. and president of Stearns Manufacturing Co. during that time.

GENE D. OLSEN, son of the founder, has been associated with the Stearns-Oakes Sales Co., as a distributor of Stearns equipment, since his discharge from the Navy in 1945. Robert O. Davis was in the employ of the Stearns Manufacturing Co. since 1935, resigning as vice-president in charge of production at Stearns to take complete charge of engineering and production in the Gene Olsen Corp.

Perlite Manufacture

THE NEW PERLITE INDUSTRY of the Dantore Division, Dant & Russell, Inc., mined and milled 2623 tons of raw ore in 1947, according to the State Department of Geology and Mineral Industries. Of that amount, 2130 tons were furnace and produced 68,771 bags of expanded perlite of 4 cu. ft. each.

At the beginning of this year the company produced 641 tons of raw perlite and shipped approximately 200 tons to a new Dantore furnace installation at Grand Rapids, Mich. Regular shipments of raw perlite to Grand Rapids will be made from the Lady Frances Mine, located on the Deschutes river.

Lower Labor Costs

LOWER labor costs for stone, clay and glass products are indicated in Los Angeles, Calif., in a survey issued by the Haynes Foundation. Timed with the revival of pre-war trends, the report is based upon the period 1929-1939, and provides 249 pages of data, tables, and statistics covering the manufacture of all durable and non-durable goods.



Gene D. Olsen

Making Roof Slabs

(Continued from page 114)

five states are tentatively being divided up into shipping and sales zones with the sales organization concentrating at the outset on the dealers nearby.

A vigorous newspaper advertising campaign is carried out in the daily and weekly newspapers where distribution centers have been established. These advertisements range in size from one-column ads to space that takes up almost one-fifth of a page.

The dealers are generally already in the building supply business. To the more distant dealers, or even some closer, car shipments are going out. The plant is doing a nice business.

Making Floor and Roof Slabs

Alongside the Sakrete plant is a new Flexicore plant that went into production last year. Both the buildings are of block construction with Flexicore roofs, and in the building housing the Sakrete plant is a modern office.

For Flexicore manufacture, the aggregates are delivered to the mixer by wheelbarrow. The forms are filled by gravity and vibrated, and then pass into the steam curing room. When cured, the structural units go out the back end of the kilns to the storage yard, and the forms go in the opposite direction, the forms being re-assembled, and travel roughly in a circle from the start to the finish. These construction units are going into many buildings in the area. In addition to being used for the roof section of the Sakrete plant, the Flexicore slabs are used for the floor of the ramp from the sack room to the car loading section. Also, the bunker receiving the damp sand and gravel ahead of the dryer is made of Flexicore slabs. Both these jobs are not only a bit novel but look well and are simple to build.

W. R. Bonsal, Jr., is president of the company; F. J. Cloud is vice-president and general manager; and R. L. Ellerbe is secretary and treasurer.

Concrete Pipe Research

THE CONCRETE RESEARCH DIVISION of the Waterways Experiment Station, Clinton, Miss., under the direction of the Chief of Engineers in Washington, will conduct a research project on concrete pipe, it has been announced. Some ten thousand dollars have been allocated to start the project. In recent years the Corps of Engineers has used large quantities of concrete pipe, especially in air field construction, resulting in a desire on the part of the Army to know more about the physical characteristics of the pipe.

BRIC-BLOC, INC., Independence, Ohio, has started the manufacture of Haydite block.



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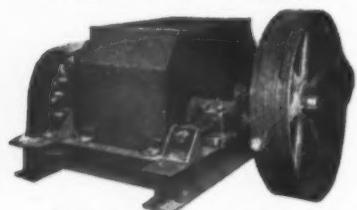
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Pumice Producers Unite

PUMICE PRODUCERS in the Western section of the United States met recently in Los Angeles, Calif., to organize a national association, to be known as the "Pumice Producers Association," for the purpose of carrying



T. Jack Foster

out an organized research program; to standardize specifications for pumice usable for concrete aggregate; and to organize the efforts of individual producers into one program for national advertising. The following directors were elected: T. Jack Foster, Pumice Aggregate Sales Corp., Albuquerque, N. Mex., president; Leonard Finch, Desert Materials Corp., Los Angeles, Calif., treasurer; and Lloyd A. Williamson, Bend, Ore.

Technical sessions were held on Monday, May 10. In the morning, Paul Jeffers, structural engineer, discussed the use of pumice concrete for economy in tall structural steel buildings. S. M. Gregory, engineer for Wailes-Bageman of Los Angeles, discussed the use of pumice in the manufacture of lightweight building units and precast products, and Mr. Wailes, owner of the Wailes-Bageman Co., gave his views on the manufacturer's relationship with the pumice producer. Phil Lockwood of Desert Materials Corp. spoke on the production, distribution and marketing problems experienced and solved by his company. L. B. Eaton, Insulating Aggregates Co., Los Angeles, Calif., discussed the production, properties and uses of pumice plaster from an insulating and acoustical standpoint, describing its use in several large buildings.

During the second session, held in the afternoon, Murry Erick, structural engineer who designed the General Petroleum Building and Prudential Life Insurance Building of Los Angeles, described the use of pumice

concrete in these two structures, and savings experienced. Dr. D. F. Roberts of Smith-Emery Co., Los Angeles, spoke on the use of pumice concrete from the standpoint of the testing engineer, and gave his recommendations as to a future research program planned to supplement work now finished and underway in his testing laboratory. Use of pumice concrete in the midwest and progress made in that area in research and practice were discussed by Jack Edwin Counts, engineer for Pumice Aggregates Sales Corp., Albuquerque, who also spoke on production methods used by his company to positively standardize the gradation of pumice aggregate being produced. He pointed out that pumice could be laid in Chicago for as low a price as it could be laid in Los Angeles.

Conclusions drawn at the sessions were that the use of pumice concrete with its low cost, high insulating values, high structural strengths obtainable at one-half the weight of ordinary concrete, and its excellent fireproofing qualities, would be the ultimate answer to low cost housing on a mass scale. Pumice concrete would also be the answer to economy of construction in intermediate and large structures such as the reinforced pumice concrete hospital, Altus, Okla.

Flexicore Association

FLEXICORE manufacturers and distributors, at their annual meeting in Dayton, Ohio, voted to form an association and elected the following officers and board of directors: President—Frederick W. Reinhold, president, Anchor Concrete Products, Inc., Buffalo, N. Y.; Vice-President—Charles V. Harker, president, Mid-States Concrete Products Co., Beloit, Wis.; Secretary - Treasurer — Eugene M. Stephens, vice-president, The Flexicore Co., Inc., Dayton, Ohio; and Stephen Stepanian, president, Arrowcrete Corporation, Columbus, Ohio, and Eugene M. Swenson, president, Calumet Flexicore Corporation, East Chicago, Ind., directors.

Other flexicore manufacturers among the 15 who formed the association are: Arizona Flexicore Co., Tucson, Ariz.; W. R. Bonsal Co., Inc., Lilesville, N. C.; Flexicore Co. of Colorado, Denver, Colo.; Concrete Industries, Inc., San Juan, Puerto Rico; Concrete Products Corp., South Bend, Ind.; Durastone Flexicore Corp., Saylesville, R. I.; Mid-West Concrete Pipe Co., Chicago, Ill.; Price Brothers Co., Dayton, Ohio; Stroudsburg Septic Tank Co., Stroudsburg, Penn.; Tri State Flexicore Co., Cincinnati, Ohio; and Wailes-Bageman, Inc., Los Angeles, Calif.

More than 8,000,000 square feet of flexicore pre-cast concrete floor and roof slabs with prestressed steel reinforcement have been furnished, delivered, and erected by the association members.

California Concrete Pipe Manufacturers Meet

CALIFORNIA ASSOCIATED CONCRETE PIPE MANUFACTURERS held their annual meeting May 12-14 at Fresno, Calif. Business sessions were held Thursday and Friday mornings and on Thursday afternoon, and the Board of Directors met on Wednesday.

During proceedings a budget of \$10,000 was adopted for 1948, including \$5000 for advertising in construction and farm journals. Recommendations were considered relative to changes in the absorption tests in A.S.T.M. specifications for concrete pipe, particularly as to the temperature at which absorption specimens should be dried and the definition of "dry weight" in the absorption tests. Revisions of the trench backfilling requirements in the Association specifications for installation of concrete irrigation pipe also were adopted.

R. D. RADER, Portland Cement Information Bureau of San Francisco, displayed a section of 16-in. diameter concrete pipe which had been in use in a San Francisco sewer for 70 years, and although hand-tamped, it showed little deterioration.

The need for revision of the specifications for concrete drain tile also was discussed. It was agreed by the manufacturers present that concrete drain tile should be made of high quality concrete and should have a

self-aligning joint. The common butt-end drain tile were said to be unsatisfactory, due to their getting out of line in certain soils, making the drain worthless. Under certain conditions, porous drain tile will deteriorate rapidly.

John M. Server, Jr., editor of *Western Construction News*, San Francisco, gave an account of the Reber Plan for San Francisco Bay which calls for direct rail and highway transportation into San Francisco and conservation of fresh water for irrigation and industrial uses.

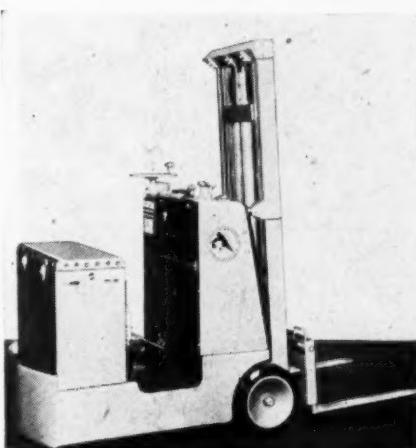
Brief talks were given by Bureau of Reclamation officials, after which 40 of the manufacturers visited the Friant-Kern Canal where they witnessed the concrete lining placement near Kings river and inspected two of the large concrete siphons on the canal.

The following officers and directors were re-elected: H. W. Chutter, Jourdan Concrete Pipe Co., president; Fred Linn, United Concrete Pipe Corp., vice-president; Hugh Pollard, Pollard Bros., Ltd., secretary-treasurer; and G. D. Williamson, Valley Concrete Pipe & Products Co.; C. V. Whalley, California Concrete Products Co., and O. H. Price, Healdsburg Concrete Pipe Co., directors.

Activities were brought to a close with a dinner dance on Friday evening.

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New model in series of electric fork trucks, has capacity of 1000 lb.

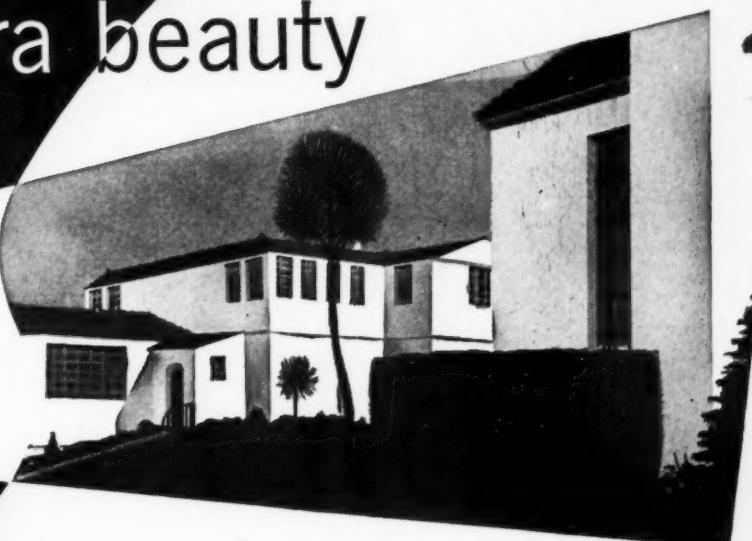
model includes features perfected on larger models, such as the telescopic lift: minimum height, 83-in., extended height, 130-in.; tricycle mounting with rear wheel steer, front wheels for drive; full view of load by operator; and ease of access to controls from either side of machine.

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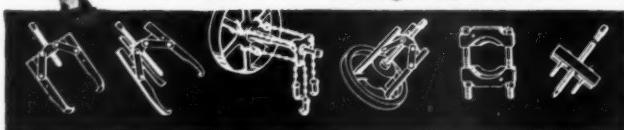
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